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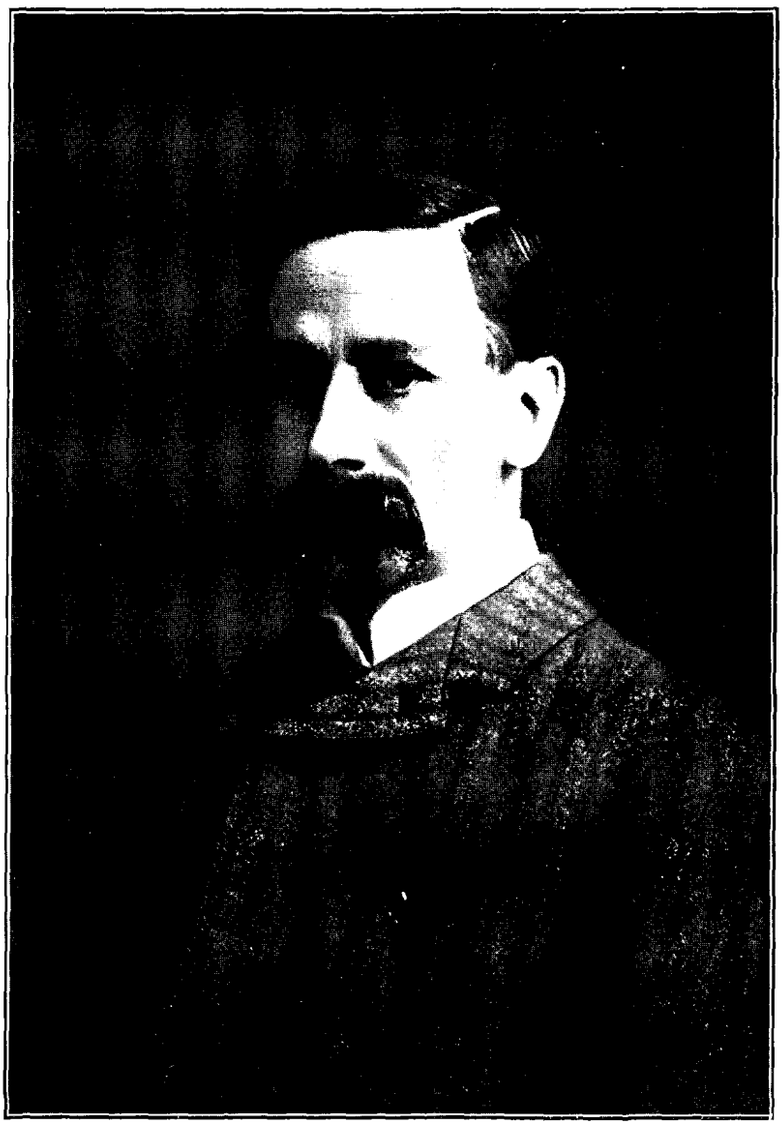
TELEPHONE MEN.

XXIII.—REGINALD ALEXANDER DALZELL.

REGINALD ALEXANDER DALZELL, third son of NICHOLAS DALZELL, M.A., Conservator of Woods and Forests, Bombay, was born in Government House, Poona, in the year 1865. He was educated first at a private school in Edinburgh, and subsequently at Dulwich College. He then joined the School of Electrical Engineering and Telegraphy in Hanover Square where he went through a twelvemonths' course of instruction. Upon completion of this course, in 1881, he accepted the position of exchange fitter in the Globe Telephone Company which had then started in opposition to the United Company. The first work assigned to him was that of fitting two sections of an upright multiple board in the switchroom which was for a short time in operation at the Wool Exchange, London. The method adopted by the American engineer-in-charge was that of fitting sections back to back with working space between, wires passing from one to the other under the flooring, proving that the value of the multiple was hardly understood. The following years were of an exciting nature pending the settlement of the patent question. In 1884 the Globe Company's business was taken over by the United, and the warfare between them ceased. Mr. DALZELL was taken into the service of the latter company by Mr. CLAY, who was then chief of the Instrument Department, and under whom he in 1885 transferred his services to the Northern District Telephone Company, being stationed for varying periods at Sunderland and Newcastle. In his position as Electrician to this company he designed the necessary apparatus to meet the requirements of metallic circuit systems to compete with the Post Office. This apparatus was somewhat heavy, but effective, and gave what was probably at that time the best working service in the country. It was here that his old colleagues in the Globe, Mr. G. F. PRESTON and the late Mr. C. M. BAILEY, joined the service under Mr. CLAY'S management. In 1891 Mr. DALZELL was appointed Assistant District Manager under Mr. JACK CHAMBERS at Bradford, and carried out some very extensive trunk construction and reconstruction, routes being built or rebuilt from Leeds and Bradford to Hull, Grimsby, York, Northallerton, and to the boundaries of the Manchester and Sheffield Districts. In this work he had the able assistance of Messrs. WILLIAMSON, HALEY, SWITHENBANK and GRAY. Upon the completion of this undertaking the routes, of which these men were justly proud, became the property of the Post Office. Upon the death of Mr. CHAMBERS, Mr. DALZELL was appointed Manager of the Blackburn District, and within twelve months was transferred to Leeds where he remained District Manager, until 1895, when he returned, after ten years' experience in the Provinces, to London as Manager of the Western District, having his headquarters at the old Pelican Club in Gerrard Street. This position he held until June, 1903, when he was promoted to assist the Metropolitan Superintendent in the control of the Service and Traffic Department. It was while holding this position that he drew out a scheme for, and assisted in, the reorganisation of the London staff by the amalgamation of the District Offices and the rearrangement of the technical work under various departments. Just prior to his promotion to the Superintendence of the Western Province in 1905 he was selected by the staff to give evidence before the Select Committee on the Post Office Telephone Agreement,



the outcome of which was the acceptance of a modification of the Agreement respecting the staff by the POSTMASTER-GENERAL. Mr. DALZELL has had an experience of telephone work extending over some 27 years, and has served four different companies which are now amalgamated in the "National," and in his position at present covers the ground previously held by a fifth. His chief recreation is golf, as that of a good Scotchman should be, and after that, gardening. The photograph reproduced here is a copy of the full-sized likeness presented to Mr. DALZELL with a very handsome gift by the London staff when he took up the appointment he now holds.

The last incident is but one of many that has occurred in Mr. DALZELL'S career, and it is indicative of the loyalty and devotion which the rank and file so markedly display for their chiefs in the service. Perhaps, when the history of this great Company has to be written, no more striking features will be found than that of the devotion of the staff to the Company's interests and their regard for their chiefs. Whether it is the wise and considerate control that has been exercised by Mr. DALZELL over the numerous staffs that have been under his care in the past, or whether there is some subtle charm in his character, the fact remains that he possesses the faculty of instilling into the minds of his staff and his chiefs a warmth of regard that in these strenuous days is but rarely met with.

THE 41st ORDINARY GENERAL MEETING OF SHAREHOLDERS.

AT the meeting of shareholders of the National Telephone Company, held on Feb. 20, Mr. FRANKLIN, the President, said he thought that the progress of the Company would at all events satisfy the shareholders that in bearing their interests in mind they (the Company) have not forgotten their duty as servants of the public. During the past year there had been added to the system 39,372 stations. That was an evidence of vitality with regard to the Company's business, and would, he thought, give the shareholders satisfaction that they were making the best of the capital with which they had furnished them, and he thought also that it should give the public confidence that they were doing all that they could to fulfil their obligations to them, and to give them a satisfactory, complete, and efficient service. Now of those 39,372 stations a very large number have been installed on what was called the measured rate system. And here he would like to say a word or two upon this subject of measured service. The development of telephone enterprise had taught them one thing, and that was the absolute unsoundness of what is known as the "flat" rate. By the "flat" rate he meant an annual charge for as many calls as the subscriber chose to send. The evils which had resulted from this method only revealed themselves by long experience. Those evils were overloaded lines, congestion of traffic, and engaged calls. A striking instance of the growth of the telephone user amongst "flat" rate subscribers was given by the Postmaster-General the other day, when a deputation waited upon him on this subject, and he gave the result of its application to certain subscribers, showing the increase in the use of the telephone during a period of five years. These were his words:

> I have had a certain number of cases taken out - a considerable number - and it appears that on the average five years ago, when they first began their flat rate, they were using 3,000 calls in the course of the year. In five years these same subscribers on the average have increased their calls from 3,000 to 11,000. In no single case have they taken a second line; they are using the same line, they are paying no more now for their 11,000 calls than they were five years ago when they were paying on the average of their 3,000 calls."

Now the Company had many cases of flat rate subscribers who were using their lines excessively, and to such an extent that 24 per cent. of the total calls made were ineffective because these busy subscribers' lines were so often engaged by outward calls that their correspondents failed to obtain them when they wanted to speak to them. Therefore shareholders would see that the constant ringing-up of the exchanges, finding more work for the operators, simply clogged the traffic, and made the last state worse than the first. Nor was it prudent or wise on the part of a subscriber, if he valued his business, that he should have his line constantly engaged. Some subscribers thought nothing of sending as many as 250 calls, and some 300 calls per day, with the result that, whilst blocking the line with calls which they originated, no other subscriber could send a call to them. Therefore it did not appear to the Board to be a sound policy to continue a method which induced these difficulties. It was generally imagined that the cost of a telephone, in capital and maintenance, was the same whether the calls were few or many, but the exact contrary was the fact--apart from the subscriber's instrument, and the line connected with that instrument leading into the exchange, every item of expenditure, whether from capital account or from revenue account, depended upon and followed the use of the instrument, The size of the switchboard depended upon the amount of traffic which was sent over the lines; the number of operators was governed by the number of calls; the size of the switchboard carried with it, of course, the size of the switchroom and everything else belonging to it. In addition to that, the local junction lines between the several exchanges in the same area, the junction lines to the Post Office, used by subscribers in connection with postal facilities and so forth, all these were regulated by the user; and therefore it is that for many years they had--as they had in other countries--been following a mistaken policy in attempting to try and keep up this "flat" rate system--the result of which was that they were constantly having to do more and more work, to spend more and more money in order to do that work, and to get not one penny more revenue for the doing of it. In the long run it was bound to come to a stop. The point that he wanted to demonstrate was that *every call costs money*, besides which it was a very peculiar feature of the telephone business that the larger the number of subscribers, the greater the capital cost per subscriber. Take one small but important part of the capital outlay. If you had an exchange of 1,000 subscribers, the capital outlay on switchboards and junctions would be about £4 per subscriber. If you had an exchange of 10,000 subscribers the capital cost would be about £13 per subscriber, and this was an important factor to remember in the growth of the telephone business. Therefore it was that the Board had felt bound to concur with the Postmaster-General in the bringing into effect of a system of measured rates in the provinces, which system, he believed, would be satisfactory alike to the department supplying the telephone service and to the person enjoying it.

The Postmaster-General made a reference the other day to the system of recording calls, and a letter in yesterday's *Times* explained that in that statement he never intended to make, and did not make, any reflection upon the National Telephone Company. The fact is that what the Post Office are doing, and what they were doing in relation to all their new exchanges—their common battery exchanges --was this. They were installing an electrical system of measurement, which would be very much quicker and very much more certain than the old system of the operators making marks on cards. The result might not be all that the subscribers might like, because the Company's experience had been that where they have introduced this meter system as compared with the card records, the payment for calls had been increased by about 20 per cent. If calls were made, such calls ought to be paid for, and the persons who were supplied with the service ought to be satisfied if they got the very best system of recording those calls that could be devised. The Company believed that this system of measured service could be justified, alike to the shareholder who had provided them with the money which was being spent in attaching new subscribers, and also to the public, who would now pay for the telephone facilities with which they were supplied according to the use which they made of them. The system had been adopted as the result of very careful study. The United States, Austria, Germany, and other European countries, as well as the colony of Australia, had adopted it, abolishing the flat rate altogether—not doing as this Company was doing, maintaining the flat rate so far as it concerned old subscribers. But in the case of Germany they were bringing into force at once the measured service in all cases. It is interesting to note that the German tariff for measured service was almost identical in rates and incidence, with the rates which the Postmaster-General and the National Telephone Company had adopted in this country, and when it was remembered that the Company was maintaining the flat rate for the old subscribers--the large users—it would be seen that the scale suggested for measured service was not an illiberal one. He was very much interested in reading the other day an account of an indignation meeting in Berlin, on the subject of telephone charges -and he read language which was somewhat familiar to them, whose ears have become attuned to similar abuse —to find that the German system was said to be the worst, most odious, and most expensive in the world. And then, it was said, "Look how very much better these things are done in England." Well, he could only say that he hoped our critics would read the expressions made by Germans with regard to the Company's service. Their opinion was that to attempt the retention of the flat rate was to ignore the result of experience, and although the Company might not in its tenure realise any great benefit from its partial adoption, it would at all events secure a fair return upon the capital which had now to be spent in order to put on new subscribers during the next four years.

The critics of this Company and its policy as to rates were now telling them how very satisfactory the position of the Company was—what a wonderfully prosperous concern, etc., etc. Time was when the shareholders heard other remarks with regard to their property. It was then described as a Company with watered capital, with inferior plant, and so forth. Let them just look the facts calmly and coldly in the face from the shareholders' point of view. The interest paid and dividends distributed upon the capital expended in this Company had never reached 4¾ per cent. per annum, and when they considered the past history of the Company, the exaction of one-tenth of their gross earnings, and more than one-fifth of their net earnings in the shape of Post Office Royalties, for which they got no service at all (hear, hear), when they considered the rates and taxes, the refusal of wayleave powers and the competition unfairly put upon them, they might well wonder how they had survived the perils of the past.

In returning thanks to the Shareholders on behalf of the Directors, Mr. FRANKLIN said that they must not forget that the Board were but very feeble instruments indeed without they had at hand a very fine executive staff, and one which he ventured to think was not equalled in any other Company. With their Secretary, Mr. Anns, their General Superintendent, Mr. Goddard, their Engineer-in-Chief, Mr. Gill, and their Solicitor, Mr. Hart, they had a staff which was unmatched in any other Company for zeal and for vigilance in watching over the Company's interests and trying to make the best they can of Shareholders and Directors' property.

SORTING FRAME FOR RECORD TICKETS.

By J. M. ANDERSON, *Chief Clerk, Glasgow.*

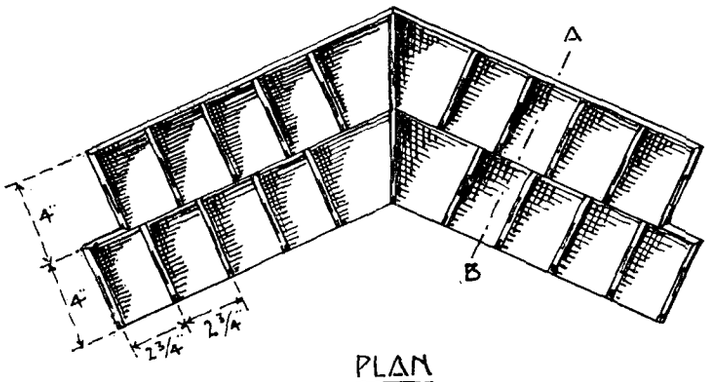
A SHORT description of a little device which has been in use in Glasgow since ticket recording was introduced some five months back may be useful. It is a very simple article, but in handling the immense number of tickets which now pass through our hands it is believed to assist us in the following ways:—

(1) It saves time. The clerk gets accustomed to the set distances between the divisions and gets through the sorting more quickly.

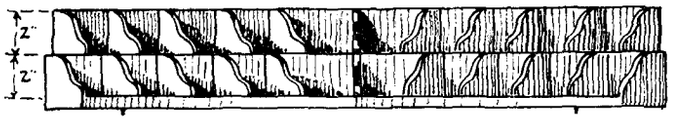
(2) It helps towards accuracy by making it a little easier for the clerk to get at the exact spot, and also because its divisions keep the different piles of tickets distinctly apart.

(3) It assists obviously to keep the work neat and tidy.

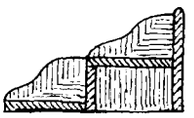
The frame is built of wood and consists of twenty divisions divided into two tiers of ten each. Each tier is again sharply divided



PLAN



FRONT VIEW



SECTION A.B. SCALE 1½" = 1'0"

in the middle; the left and right halves instead of being in a straight line slope inward from their extremities, meeting in the middle at an angle of about 150°. The idea of sloping the frame in this fashion is to make the divisions as nearly as possible equidistant from a central point, say, the clerk's shoulder. The perfect arrangement would have been a crescent shape, but this would have added materially to the cost.

Underneath the frame at the two extremities two tiny brass bolts are fitted which slip into sockets fitted on the desk at which the sorting clerk works. These desks have a slope and to conquer the tendency of the tickets to slip out from the polished surface of the wood it will be noticed that the front of each division is tilted up.

Now as to its method of use. Our problem is to separate each subscriber's tickets. With the smaller exchanges this can easily be done in one process, but with the larger it is necessary to divide it into stages. Here are the details of the stages now used by us:

Range of numbers.	Units of the various sortings.			
	First sorting.	Second sorting.	Third sorting.	Fourth sorting.
Over 3,000	500's	100's	10's	1's
800 to 3,000	200's	20's	1's	...
300 to 800	100's	10's	1's	...
70 to 300	20's	1's	...	...
20 to 70	10's	1's	...	...
Under 20	1's	...	...	...

Thus, in an exchange of 1,000 recorded numbers the complete separation is accomplished in three stages:

First stage separates into five bundles covering 200 numbers each.

Second stage separates each of the above units into ten bundles covering twenty numbers each.

Third stage separates each of the above units into twenty bundles covering one number each.

At each stage the frame is employed, one of its divisions being used to hold the tickets for each unit.

Details of the frame could of course be altered to suit any given district, in accordance with its number of subscribers and of tickets. The number of tiers of ten divisions could be anything from one up, and the depth of each division could be varied. The frame was designed to assist particularly with the sorting into the lower denominations, viz., 10's, 1's, etc. Divisions which will suit the number of tickets per unit at these stages are not of course entirely suitable for the stages at which the units are from 100 to 500. To meet this difficulty a second frame could be used with a much greater capacity in the individual divisions and a smaller number of them.

TELEPHONE "POPULARITY."

THE lady of the house, the second day after the coming of the new maid, whose last place was with a society leader, was to have callers. Just before the company came the maid said to her mistress, in a confidential tone:

"Shall I go out and telephone to you while they are with you?"

"Telephone!" exclaimed the mistress. "Why, what do you mean? What in the world would you telephone to me about?"

"Oh, about anything at all," exclaimed the maid. "Don't you ever have it done? Why, at my last place and the one before that, too, I always telephoned the missus. She instructed me to it was to give the impression to her callers that she was very popular and overrun with engagements."

But the maid's new mistress, remembering many telephone calls that interrupted the conversation when she herself had been calling, and now regarding them with suspicion, declined to make a personal exhibition of popularity on those terms.—*Telephony.*

INDIRECT RETURNS FROM THE HOTEL BRANCH EXCHANGE.

CONTRACTS for hotel branch exchange systems are being signed so frequently that within a comparatively short time nearly every important hostelry in the country will have in every room an instrument from which patrons may talk with all persons who can be reached over lines extending from the nearest exchange.

The advertising value of this class of service should not be overlooked, but is a point especially worthy of consideration. Travelling men are no less likely than others to criticise the telephone service which they find in any of the places they visit, and if their criticisms are favourable they are widely spread among business men all along the routes which they cover. Where telephones are installed in hotels, and long distance facilities are used to cover a wide range of territory, as they frequently are by this class of customers, a two-fold advantage accrues to the telephone company maintaining the system. In the first place, it picks up a good revenue on the spot; and in the second place, people in a half-dozen surrounding towns who should be doing a considerable amount of telephoning are reminded of the facilities which are at their disposal. One reminder from an outsider in the shape of a genuine call, and a satisfactory conversation, is worth more than a dozen invitations from the telephone company.—The *American Telephone Journal.*

CRITICISMS AND SUGGESTIONS ON UNDERGROUND AND OVERHEAD WORK.

BY C. E. TATTERSALL, *Divisional Engineer, Eastern District, London.*

IT is my idea in this paper to offer a few short suggestions and criticisms of underground and overhead work, which might lead to the discussion of, and perhaps improvements on, methods and material adopted and used by the Company, and I feel sure that members of the staff could put forward suggestions on each item, and on others not mentioned, which would be beneficial to the service.

UNDERGROUND.

Distribution.—Individual distribution in residential suburbs in course of development and in good-class property will in future be

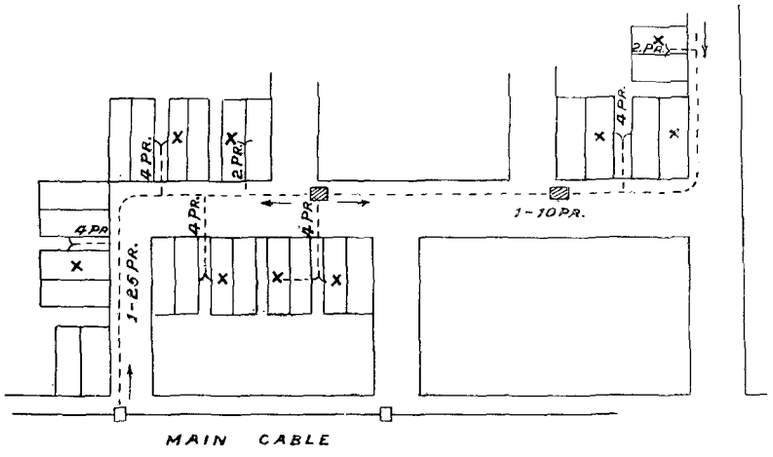


FIG. 1.

a great factor in the success or otherwise of telephone development in such areas. I have an ideal case in point where in most of the roads on which orders have been obtained, the houses are of a superior order, and the erection of overhead routes, or even distributing from underground by overhead routes, would lead to agitation against the Company by the residents. Fortunately support has been received which justifies the Company laying underground in the first instance.

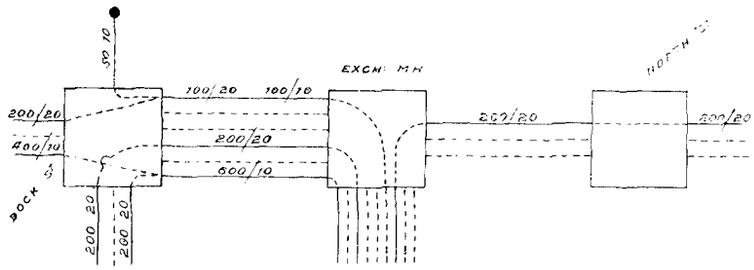


FIG. 2.

The diagram (Fig. 1) shows one of the areas. The houses are all semi-detached, the orders to date given at points marked X. A 3-inch pipe is laid in the pathway to the furthest point with surface boxes at each branch road for future extensions, buried chambers, as small as possible, split tee pipe (suggested but not yet approved by Head Office), being constructed at points where two or four-pair cables are taken out. The latter are laid in ½-inch gas barrel which has a tee at the end to take out one pair or two pairs either way, the branches being teed on to the main so that the loop or loops can be used again if thrown spare without having to open up the ground where joined to the main.

Of course it is a great consideration in all methods of distribution as to the best means of providing your main branches so as to use the smallest amount of wire, although I would suggest the multiple system in such cases.

Drawing In Cable.—A rather interesting experience of work done at high pressure is the one 3-inch pipe and 100-pair composite cable lately laid from Barking to Tilbury, a distance of twelve miles. This was practically all country road and within a fortnight of the contractors' starting the laying of the pipe the cable was placed on order and we commenced laying when the pipe was half laid. Of course we were absolutely sure that no difficulty would be experienced in obtaining correct positions for our boxes and splits. Lengths averaging 320 yards were pulled in on the whole section, one joint being saved in every two lengths. Petroleum jelly was used to a great extent and proved its superiority to the ordinary lubricant previously used.

Numbering Cables.—The question whether a main should be numbered consecutively through the whole loops or each branch numbered individually and independently of the main is at present under consideration, and, whilst I consider the latter the best method, it would be interesting to know the views of various engineers. I would like, however, to suggest that the same method of numbering cables be adopted by both the Company and the Post Office; at present one starts from the inner core and the other from the outer, which is of course liable to lead to serious errors.

Boxes.—A record of the cost to the Company through the use of split pipes and buried chambers, particularly the latter, as against surface boxes, would I think be an eye opener to the Company in favour of the universal adoption of surface boxes.

Drawing-in Rods.—As at present supplied these are not strong enough for the purpose, as 80 yards is about the longest length that can be pushed through, which means a case of fishing at the other end and consequently great waste of labour. I would suggest a rod 3 feet 6 inches length with 1¼ inches diameter.

Records.—Apart from the usual records kept in accordance with D.P. Instructions I have found the plan shown in Fig. 2 of great value :—

Dotted lines represent spare ducts; joints are shown in each square, which represents a manhole or surface box. It is not

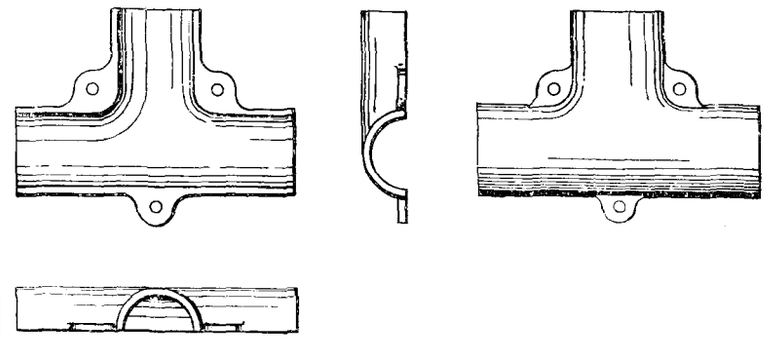


FIG. 3.

necessary to have this to scale, and by such a plan one can have at a glance full particulars of all underground in the district, however large it may be, and it much facilitates new schemes.

Concrete Blocks.—I think it will be agreed that the great drawback with these is the breakage during transit, particularly of the socket ends. I would suggest a metal core of cheap material, as at present the joins have to be well packed with yarn to prevent cement running into the ducts, and it is doubtful if this is done properly and if small pieces do not penetrate, subsequently causing damage to the lead of the cable when being drawn in. I am also of the opinion that larger diameter is required.

Drum Shifters.—This tool will be found very useful in the rolling of drums (see Fig. 4).

Pipes, 3-inch.—I would suggest that 6-feet pipes be kept in stock as cases arise on curves where it would be an expensive matter to build boxes, when splits are not of the requisite bend, and consequently pipes have to be cut, which of course is objectionable, on account of the spigot or socket end being cut away.

Joints.—A most important part of a jointer's duty is of course to dry out the joint well before plumbing the sleeve, and I am sure cases are continually arising where neglect of this causes immense expense and worry.

Manholes.—Care should be exercised to set the manhole cover

so that the cables when laid will not be made use of for stepping purposes. This is very often overlooked by inexperienced inspectors and is a fruitful source of faults.

OVERHEAD.

Saddle Wires.—Would it not be advantageous to bring these into use again, in view of power wires, where probably only one is required on certain routes?

Cross-connecting Lead Supports.—A simple device is a piece of No. 8 wire turned so which can be attached to insulator bolt and looks very neat under arms.

Stay Rods.—These are generally condemned purely on account of the thread going; why not adopt house-top pattern swivels, with hook on rods?

Corner Brackets.—In a good many cases these have to be used on chimneys owing to stacks being party stacks, and complaints continually arise of the Company's encroaching on the adjoining owner's stack. If therefore the arms were shorter this would be avoided.

Ladders.—Country gangs or outer London gangs, I think, should be provided with extension ladders such as window cleaners

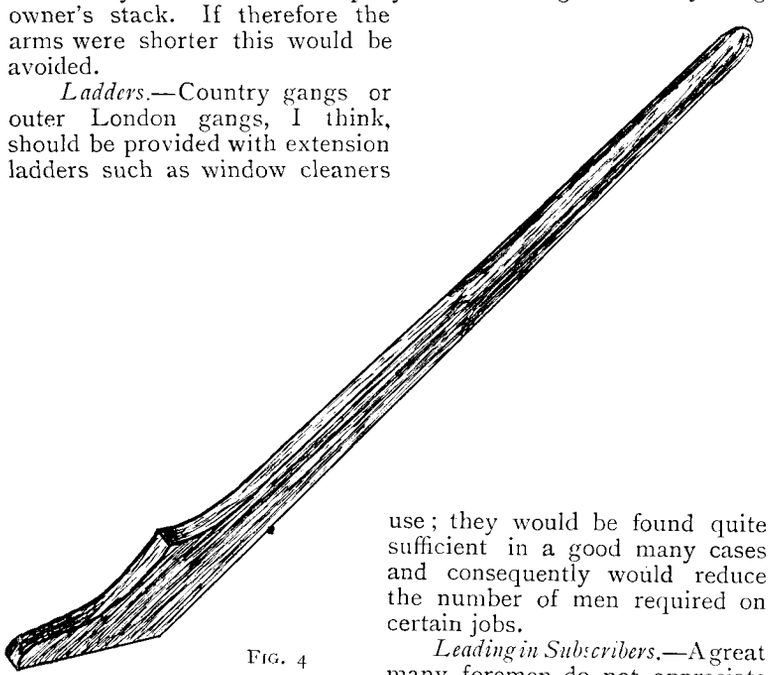


FIG. 4

use; they would be found quite sufficient in a good many cases and consequently would reduce the number of men required on certain jobs.

Leading in Subscribers.—A great many foremen do not appreciate the improvement in service consequent upon reduced leads into subscribers' premises. Greater use could be made of eave brackets, ridge-screws, cups, etc., etc., and I find it a good idea to make the responsible engineer or walking foreman of each set of gangs engaged see every branch after it is completed. No one appreciates the great advantage of this until the exchange has been converted into common battery.

Power Wire Cables.—At present there is no specially recognised method of making these off on poles or brackets. It would be interesting to know the various means employed so that a universal method could be adopted.

Oak Arms.—I have noticed in my travels that eight-way arms are fitted on new routes where four-way would probably be ample for some years for the routes in question; in consequence, they are unsightly in appearance as well as an unnecessary expense.

Ground Poles.—In a great many cases foremen erect poles out of the plumb to help the angle they may have on the route of wires to be erected, even if the necessary staying power can be had, with the ostensible purpose of pulling up straight when erecting the wires; but in nine cases out of ten this is never done, and the view presented is irritating. In very few cases is this method of construction necessary.

Aerial Cables.—The side of the pole on which cables should be run is a matter on which engineers differ, some fixing on the outside of the angle others on the inside, the contention in favour of the first method being that in the event of breakdown the cable is not likely to do so much damage; but the latter method I think is correct, as the cable s then less likely to be damaged during the time it is in use by chafing against the pole.

Insulator Guards.—This is a very important point, and I think something definite should be settled upon. The latest suggestion is of course the enamelled protector, but this is found to reduce slightly the insulation of the line, and in my opinion we could not do better than adopt the spiral wire protector. I had these latter fitted on one route carrying two wires, seven years ago, and when I last examined them not one of the insulators had been broken.

LORD KELVIN ON THE INVENTION OF THE TELEPHONE.

IN an article in the New York *Electrical Review* entitled "Lord KELVIN as a Scientist," the following interesting quotation from an address given by Lord KELVIN on Sept. 7, 1876, to the Mathematical and Physical Section of the British Association is given:—

"In the United States telegraphic department I saw and heard ELISHA GRAY'S splendidly worked out electric telegraph actually sounding four messages simultaneously on the Morse code, and clearly capable of doing yet four times as many with very moderate improvements of detail; and I saw EDISON'S automatic telegraph delivering 1,015 words in 57 seconds—this done by the long-neglected electro-chemical method of BAIN, long ago condemned in England to the helot work of recording from a relay, and then turned adrift as needlessly delicate for that. In the Canadian Department I heard 'To be or not to be—there's the rub' through an electric telegraph wire; but, scorning monosyllables, the electric articulation rose to higher flights, and gave me passages taken at random from the New York newspapers. All this my own ears heard, spoken to me with unmistakable distinctness by the thin circular disc armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Professor WATSON, at the far end of the telegraph wire, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform in the neighbourhood of an electro-magnet in circuit with the line motions proportional to the sonorific motions of the air. This, the greatest by far of all the marvels of the electric telegraph, is due to a young countryman of our own, Mr. GRAHAM BELL, of Edinburgh and Montreal and Boston, now becoming a naturalised citizen of the United States. Who can but admire the hardihood of invention which devised such very slight means to realise the mathematical conception that if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and as nearly as may be in a simple proportion to the velocity of a particle of air engaged in constituting the sound?"

NATIONAL TELEPHONE (FACTORY) PROVIDENT FUND.

THE sum of £81 10s. has been subscribed during the year 1907 by the employees of Notts Factory, and in accordance with the usual custom the following grants have been made to local charities:—

	£	s.	d.
General Hospital	36	0	0
Dispensary	10	0	0
Convalescent homes...	7	10	0
Eye Infirmary	5	0	0
Childrens' Hospital	5	0	0
Women's „	3	0	0
Samaritan „	2	0	0
Nursing Institute	3	3	0
Sanatorium for Consumption ...	5	5	0
Throat and Ear Hospital	2	10	0
Sisters of Nazareth	2	0	0
	£81	8	0

£433 represents the amount disbursed by this fund during the eight years of its existence.

WHAT IT IS TO BE A NIGHT OPERATOR: THE DIFFICULTIES AND RESPONSIBILITIES.*

BY KAROLINA D. LAING.

IT is thought this paper may interest many who have the idea that there is little or no work at night. It is strange that they should think so, as in a large and ever-growing city many people are turning night into day, not only for pleasure, but for important business transactions. Calls are made by reporters, police, hospitals, doctors, and in fire and ambulance cases. So you will see by this that it is not all play to be a night operator. Some of the most important calls are made during the night; for instance, a subscriber calling for a doctor. Doctors, who should answer their telephones immediately, are sometimes found to forget to put the switch through to their bedroom. Then we have important calls from men who work all night at the works, and wish to speak to their managers. After we have been ringing for some time and fail to get them, the workmen reply, "Oh, Miss, do ring them again, as it is most important that I should speak to Mr. So-and-So because the engine has broken down, and the men cannot work," or something else equally important. Knowing the difficulty the caller is in we make another attempt and eventually get the party desired after ringing a considerable time. It is wonderful how much people depend upon the telephone.

Our busiest times as a rule are from nine o'clock until twelve o'clock, and from six in the morning until eight, during which time there is a continual rush. The operator does not stand at one board all the time, as the junction cannot be answered on a local board, and the consequence is that she has a great deal of running about to do, but everything is done quickly.

A night operator working on a local board must be able to know a number immediately it drops on any board round the room. But this is not the only difficulty she has to contend with. For instance, a subscriber may give the name only, making the excuse that the number he requires is not in the list, or that he is in the dark, or something to that effect. No matter how busy the exchange may be, the operator has to look in the list, and in the meantime the room is practically left to two operators. Again, where automatic cash boxes are fitted a subscriber will call for a number, the operator gets the "called for" subscriber to the telephone, and asks him to put a penny in. He replies, "I did not know it was a penny in the slot machine, half a minute I will get change," and after waiting a considerable time he eventually returns. Again, a subscriber will ring for a number, is asked to put the penny in, and will reply, "I have put it in," though the operator knows for a fact he has not. Knowing he cannot go through, he will then, after much arguing, put the penny in.

The rule is to give subscribers two periodical rings, but at night it is necessary to break this rule, in order to oblige them, by ringing for minutes at a time. This requires a great deal of patience, and reminds one of the old saying which runs "patience is a virtue, seldom found in women, but never found in men," the calling subscribers being so persistent and impatient that they expect a response before the called subscriber has had time to receive the ring.

Other important calls (too numerous to mention) are those in cases of fire, burglary, etc., and those from the electric car stations which ring continually and regularly in the early hours of the morning.

Subscribers are not always as careful as they might be in asking for a number, but fortunately we know pretty well the numbers usually asked for during the night, or I am afraid we should have a great many complaints from people who have to get out of bed through a mistake being made in the number. For instance, we are asked for No. 201. When asked what name they require, they answer "Thompson, cab proprietor," which is 210. The following numbers are often misquoted:—118 for 108, 1972 for 1792, and so on. These points we have to watch very carefully. A lady subscriber rang up early one morning asking if we knew the nearest locksmith, as the kitchen door was locked from the inside, and she could not get her husband's breakfast ready. A lady rang up one night, saying: "Are you there, Central? Will you ring me such and such a number? Please give them a good ring as they are having a party, and my daughter is there, and it is getting late." After ringing a considerable time, we informed the subscriber that no reply could be obtained. "Oh, but go on ringing them," she replied, "they will answer in time." It can be imagined what would happen if many such calls were made by our subscribers. The questions such as the following are often put to us:—"Are you there, Central? Can you tell us who has won the boat race?" Or, "Have you heard the latest news of the Druce case?" Or, "Can you tell us who has won the match?" Or, "Can you tell us where the fire is, as the engine has just passed our house?" Frivolous calls of this kind occur incessantly. We are taken not for operators but for talking newspapers.

We have exceptionally busy nights when it is raining heavily and subscribers are continually ringing up for cabs. Then there are balls, whist drives, concerts, etc., and sometimes we are even asked who lives at such and such an address, or "Central, can you tell me who rang me up about half an hour ago? my maid has forgotten the number." Another common question when the called for subscriber is engaged is: "How long will they be?" or "Are they there, do you think?" The work fluctuates a great deal. We never know from one minute to another how busy we shall be. Another difficulty to be mentioned is that caused by subscribers leaving their receivers off the hook. This is rather careless on their part, and is of frequent occurrence. The operator then puts on the "howler." Even that does not always fetch them, although the noise is enough to wake the soundest sleeper. Subscribers do not comprehend the fact that we can do nothing more than ring. We have both to listen and attend very carefully, as the indicators drop sometimes without the least sound. The two record nights of the year are Christmas and New Year's eve. I think then everyone connected with the telephone rings up someone. Everybody seems desperate and busy, and the indicators shower down, waiting to be answered. I remember early Christmas morning someone rang up, saying, "I say, Central, my turkey has not arrived yet. Will you get the station—Goods Department—quickly, or I am afraid we shan't have our Christmas dinner?"

Traffic has increased greatly within the last few years. When I first commenced night operating, party lines, and measured rates, junctions and order wires were things unheard of, and the operating has become much more complicated than it was years ago. I have come to the conclusion that the majority of subscribers would feel lost without the telephone, saving as it does many journeys, many postage stamps and, in some cases, a life.

* Abstract of paper read before the Sheffield Telephone Society.

INTERESTING OUTCOME OF OBJECTION OF A CHAMBER OF COMMERCE TO THE MEASURED RATE.

AN interview between the committee of a Lancashire Chamber of Commerce and the Provincial Superintendent of the National Telephone Company to discuss the new rates has had an interesting result. The vice-chairman of the chamber, the principal of a large firm with extensive but badly telephoned works, was one of the most difficult members of the committee to convince, but after some conversation was persuaded to take a broad view of the rate question.

The service of his own firm was brought into discussion, and after a further interview, this time with the Company's District Manager, he agreed to accept the measured rate with an additional junction line at his works. The case is interesting as the outcome of the Chamber of Commerce's objection to the rates.

WORKERS' CONTRIBUTIONS TO CHARITIES, PAISLEY.

AT the annual general meeting of the staff of the Paisley centre, held on Dec. 23, the treasurer of the above fund reported that the amount collected during the past year was £14 5s. 9d., which sum it was duly proposed and seconded should be allocated as follows:—

Royal Alexandra Infirmary, Paisley	£6	0	0
Royal Victoria Eye Infirmary, Paisley	4	0	0
West of Scotland Homes, West Kilbride	2	0	0
Workshop for the Blind, Paisley	1	0	0
Total	£13	0	0

carrying forward a balance of £1 5s. 9d.

ACQUISITION OF THE ITALIAN TELEPHONE SYSTEM BY THE STATE.

INTERESTING particulars of the purchase of the Italian telephones by the Government are given in *Archiv für Post und Telegraphie*. Two principal laws, it would appear, regulated telephone affairs in the past, that of April 7, 1892, allowing the construction of local, junction, and trunk wires to local bodies and to private undertakings, and that of Feb. 15, 1903, vesting the construction of trunk wires in the State. The latter was the first step towards nationalising the telephones in Italy, and was followed by the law of July 15, 1907, by which the State acquires the local systems and trunk wires of the two large private companies, the Società Generale Italiana di Telefoni, and the Società Telefonica per l'Alta Italia, the first operating in Venice, Genoa, San Remo, Palermo, Messina, Catania, Naples, Bologna, Florence, Leghorn, Rome, etc.; and the second in Milan, Como, Turin, Alexandria, and other places. A general director of telephones is to be appointed. He will be assisted by eight technical administrative telephone councillors, consisting of three high State railway officials, two high telegraph officials, two high Treasury officials, and a University professor of electricity. The telephone system will be divided into nine districts with offices at Turin, Genoa, Milan, Venice, Bologna, Florence, Rome, Naples and Palermo.

Works projected by the private companies are to be carried out by the Government. The Minister of Posts and Telegraphs is authorised to expend £1,000,000 as follows:—£120,000 in the budget year 1906, £40,000 in 1907, £120,000 in 1908 and 1909, £80,000 a year from 1910 to 1916, and £40,000 in 1917. These sums are to be applied in paying off the two private companies, the erection of provincial exchanges and extension of the system generally, the placing of overhead wires underground, and the change from iron and steel to copper wires.

Within a year of the publication of this law, the Government is to lay before Parliament Bills for the reform of local telephone tariffs; and for the better protection of telegraph and telephone wires against high potential currents.

The prices paid to the companies for their systems were as follows:—

SOCIETA GENERALE ITALIANA.

	£	s.	d.
Principal systems	384,912	0	0
Venice system *	40,968	8	0
Smaller systems and trunk wires	35,815	10	5
	£461,695	18	5

which will be paid off without interest in eleven yearly payments of £41,972 7*s.* 3*d.* from Sept. 1, 1908.

SOCIETA ALTA ITALIA.

	£	s.	d.
Principal systems	226,955	0	0
Smaller systems and trunk lines	31,771	13	0
	£258,726	13	0

which will be paid off in eleven yearly payments without interest of £23,520 12*s.* from Sept. 1, 1908.

Included in the above repurchases are all materials in use on July 1, 1907, all apparatus, exchange fittings, systems of lines, all subscribers' apparatus not owned by the subscribers themselves, workshops, and office furniture. Premises when leased, the State takes over as under-lessee. The buildings belonging to the companies are acquired at a total price of £19,756 16*s.*

It is interesting to note that the State can retain the companies' staff if in receipt of less than (£120). Those in receipt of £120 a year and above can be taken over at a salary of £120, and the difference between this amount and their old salary paid to them as a personal grant until such time as the proposed new Bill for the reorganisation of the staff is brought in. These arrangements are contingent on certain conditions as to health, suitability, etc.

The law of July 15, 1907, therefore assures the nationalisation of the Italian telephones. The systems transferred to the State comprise 74,000 kilometers of lines and three-quarters of the total number of subscribers; those remaining in the possession of 71 existing private undertakings are of small importance. The total cost to the State was (exclusive of buildings) £720,422.

From the latest returns available the number of telephone stations possessed by both companies does not appear to exceed 30,000.

* Venice is treated separately because the local system was compulsorily placed under Government working in February, 1904, after gross irregularities.

WIRELESS TELEPHONY.

THE following review of ERNST RUHMER'S book on *Wireless Telephony in Theory and Practice*, which appeared in *The Times*, is reprinted to enable our readers to follow the development of this interesting branch of the science of telephony:—

"To those who have endeavoured during the last quarter of a century to follow the progress of experimental physics throughout the domain that unites electricity with optics, this remarkable account of what has been achieved towards the attainment of a practicable system of wireless telephony will appeal with singular force. The author has the knowledge and enthusiasm that springs from direct acquaintance with the phenomena in the laboratory, and his book, unpretentious in size, and free from superfluous matter, conveys a comprehensive and inspiring account of the subject. For reasons not always apparent, he has occasionally avoided historical order, and it must be confessed that his historical matter is now and then obscure. He has, however, kept steadily before him the task of describing the methods and the apparatus that have proved to be successful, or that have assisted towards success, and in this respect the book is an achievement worthy of its author and its translator. It is refreshing to hear again the story of the discovery of the selenium cell, and to be reminded of the photophone developed from it by Graham Bell and Tainter. This account, if space had permitted, might have been extended to include a recital of the curious results obtained by Becquerel, Shelford, Bidwell and Minchin. Early work of the kind he describes, however, in which the selenium cell was used with a telephonic receiver, the transmitting apparatus being some kind of diaphragm-mirror against which the speaker directed his voice, and from which a beam of light was reflected to the sensitive cell at the conjugate focus of a second mirror, soon departed, the author tells us, 'to the realms of oblivion.' The second phase in the development of wireless telephony by the agency of light began somewhere about the year 1898 with the discovery of the 'speaking arc,' which the author ascribes to Simon. This refers to the phenomenon that when a circuit in which there is a rapidly interrupted current is brought near to an arc-lamp circuit fed by direct current the arc emits noises corresponding to the interruptions. The oscillatory currents are, in fact, superposed upon the direct current, and the arc responds to them. But, although the author at p. 20 describes 'the discovery of the speaking arc by Simon in 1898,' the 'corrector' in a footnote at p. 32 mentions that 'the priority of Hayes and Bell in regard to the speaking arc is no longer a matter of doubt,' for they filed an American patent on June 7, 1897, in which the speaking arc with photophonic and thermophonic receivers, connected with condensers, inductive shunts and transformers, are shown. If Fig. 24, describing the shunt circuits, is correctly representative, as the footnote says it is, of the invention of Hayes and Bell, it would appear that the arrangement in Fig. 28 requires further differentiation, for the author describes it as being 'based on Duddell's speaking arc connections.' Leaving the question of priority for the moment, however, the reader is able to trace the course of events which in 1901 enabled Simon with a 'speaking arc' transmitter and a selenium receiver to convey speech across space for one or two miles with success. After a chapter on electro-magnetic induction telephony, the author regains his thread, and he conveys a masterful account of the work that has rendered wireless telephony a practical method of communication. Here the influence of wireless telegraphy is clearly seen, the effect of it being that investigators sought to replace the 'sending' key of the apparatus of Lodge by a microphone, that should enable articulate sounds to be transmitted by a rapid sequence of oscillatory discharges. They failed at first, because the succession of sparks was insufficiently rapid, or because the trains of waves were separated by irresponsive pauses. Attention was then directed to the spark-gap itself, and attempts were made to control it by Röntgen or by cathode rays, which themselves were governed by the movements of a diaphragm vibrating to the sounds to be transmitted. Then followed the experiments of Majorana, who, with a transmitting apparatus fed from the town mains at 40 alterations per second, contrived by means of an oscillatory circuit provided with choking coils to attain to a spark rate of 10,000 per second. This chapter on the arc as a high-frequency generator gives an admirable account of the facts, but it is unconvincing on the question of history. The 'musical arc' is stated by the author to have been observed first by Lecher, and to have been thoroughly investigated later by Duddell and Peuckert. Nevertheless, he suggests that it is doubtful whether Elihu Thomson in 1892 observed this phenomena or not. If a matter of this kind cannot be settled definitely, it is, as a rule, wise for a writer to leave it alone. Fortunately, the achievements of Mr. Duddell are too many to be affected by the challenge of a single claim, and, moreover, the superposition of higher conceptions upon the steady progress of ideas is a mental phenomenon quite in harmony with the results he has made his own, and he will know how to deal with it. On the other hand, it must be remembered that the book covers a vast field of complex research, and that in a first edition it is necessarily difficult to negotiate comprehensively with every detail of claims to priority. In the concluding chapters the author describes the high-frequency alternators, and the methods that have been introduced for producing undamped waves of high frequency. The final remarks are by the translator, who adds some significant notes upon recent advances. He is to be congratulated upon the selection of his task, and upon the excellent manner in which he has accomplished it; for this is a book that marks an era in the progress of applied

science, and that unites a multiplicity of phenomena which awaited wireless telephony to give them meaning and direction."

Professor Ayrton writes the following letter to *The Times* on the subject:—

"In a very interesting book published about a year ago by Ernst Ruhmer on *Wireless Telephony*, and just translated from the German by Dr. Erskine Murray, it is very clearly shown what an important part in this subject is played by the 'musical arc,' discovered by Mr. Duddell, F.R.S., in 1900 (in his attempt to find a method of producing a high-frequency alternating current for the measurement of the *true* resistance of the direct current arc).

"But on p. 142 of the English edition of this book there is this surprising statement:—

"'The *Musical Arc*. This phenomenon was first observed by Lecher, and was more thoroughly investigated later by Duddell and Peuckert. (*Lecher Wied. Ann.* XXXIII., p. 693, 1888.')

"Since, in 1900, when Duddell discovered the musical arc and, in November of that year, took out his patent for its application to wireless transmission, he was one of my students at the Central Technical College. I am quite certain that he had no idea that anybody else had ever thought of it. On the other hand, since in Mrs. Ayrton's book on the electric arc, published in 1902, she showed what splendid work Lecher had done on the arc, it was of course within the bounds of possibility that Lecher might really have discovered the 'musical arc.' But on showing her, a day or two ago, Dr. Erskine Murray's book, she assured me that there was no reference to the 'musical arc' in any of Lecher's publications. To make doubly certain, I looked up *Wiedemann's Annalen*, Vol. XXXIII., 1888, p. 693, and I found, first, that p. 693 dealt with the kinetic theory of gases by another writer, and *not* by Lecher at all. This error, however, in page is but a small matter, because there is an article by Lecher on the direct-current arc (which Mrs. Ayrton refers to in her own book) on pp. 609 to 637 inclusive of Vol. XXXIII., *Wied. Ann.*, 1888, which is of great interest.

"It seems that he was then engaged in testing Wiedemann's idea that the current in an arc was always intermittent, even when the source of the current was a battery; and to try this he set up the arrangement, shown in Fig. V., plate 6, at the end of this volume, in which the arc is shunted with an inductive coil in series with a condenser and a hot wire ammeter (as we should call it at the present day), and Lecher certainly found that in this branch circuit the current was not constant, because between the terminals of a secondary coil put round this inductive coil in the circuit, which was a shunt to the arc, he was able to get minute sparks. But he had no idea that such a combination could cause the arc to produce a musical note, still less that the note could be tuned or altered by varying the induction or capacity. And certainly he had no conception that tunes could be played on the arc ranging over several octaves, as Mr. Duddell experimentally showed at the Institution of Electrical Engineers and at the Royal Institution.

"Indeed, Lecher thought that the inductive coil in the circuit was a *disadvantage*, since he considered that it damped out the variations of the current, and he removed this coil. So that in his most successful experiments he had only a condenser and a hot wire ammeter in series with one another, as a shunt to the direct-current arc.

"The wonder is that, being so near the discovery, such a clever investigator as Lecher did not make it. But 'a miss is as good as a mile,' and there is no doubt that it is to Duddell in 1900, and *not* to Lecher in 1888, that we owe the discovery of the 'musical arc.'

"I do not remember whether it has been ever published that during the course of Duddell's experiments at the Central Technical College in 1900 he found that *unintentionally* he was superimposing on the mains of the Kensington and Knightsbridge Electric Light Company tunes which he himself was playing, and which, to the surprise of Sir William Abney and his staff, were given out by an arc in another laboratory about half a mile away from my own.

"W. E. AYRTON."

POST OFFICE ENGINEERS' DINNER.

THE fifth annual dinner of the London Engineers' Department was held at the Grand Hotel, Trafalgar Square, on Tuesday, Feb. 18, Major O'Meara, C.M.G., R.E., Engineer-in-Chief, presiding. The guests of the evening included the Right Hon. Sydney Buxton, M.P., Postmaster-General; Mr. Babington Smith, C.B., C.S.I., Secretary; Mr. A. F. King; Mr. H. S. Carey; Mr. A. M. J. Ogilvie; Sir John Gavey, C.B.; Sir John Cameron Lamb, C.B., C.M.G.; Hon. R. D. Denman; Lieut.-Col. Price, C.M.G.; Dr. Glazebrook; Dr. Walmesley; Mr. G. Morgan; Mr. A. E. Eames; Mr. J. Kingsbury; Mr. H. Hirst; Mr. J. W. Willmot, etc., etc.

Mr. SYDNEY BUXTON, in proposing the toast of "The Engineering Department," after observing that in the death of Mr. Gaine the science of telephony had lost a very valuable friend and one who was of the greatest assistance to the improvement and extension of a great branch of public usefulness, and after referring to the death of Lord Kelvin, said that in their own way they had also experienced a loss inasmuch as they had lost Sir John Gavey, but he was glad to hear that Sir John had been retained to keep a watching brief over various matters which might occur in the future, one of which—perhaps the most serious of which—would be the tussle which they would have with the National Telephone Company in 1911. He further said that he wished to recognise to the full the zeal which had actuated the members of the department in carrying out the duties allotted to them—in some cases under severe strain and severe pressure. He said also that at the present moment the Secretary and he were having trouble with the outside world in the shape of Chambers of Commerce with regard to the rates charged for our telephones. They want to have their service at a very low price. The Secretary and he wanted them to pay a very fair and very moderate charge for their telephones. At all events he thought that the general feeling with regard to telephones is this, that unlike the telegraph service, the telephone service ought to be put on a paying basis. This was the inside of the platter, and they were concerned with the outside.

Major O'MEARA, responding to the toast of "The Engineering Department," said that the phenomenal growth which had been referred to at these meetings had been continued. What had been referred to as the great transfer was still the great problem which had to be tackled by them. Their appetite had been slightly whetted since their last annual dinner, for they had already swallowed up the municipal undertakings in Glasgow and Brighton. The Postmaster-General had told them of his dealings with the Treasury. He thought it only showed that he had got some of the qualities of his own countrymen: persuasive eloquence. For he had succeeded in getting funds, and he had been able to do a great deal not only in the matter of telephonic development, but also in providing for the extension of the underground schemes in which they had been so interested during the last few years. In matters telephonic their cousins across the mill pond were supposed to take the lead. Well, gentlemen, they all acknowledged that they owed a great deal to their cousins, but they also felt that their engineers had not been content to be simply followers. They themselves had in matters telephonic also exerted their ingenuity, and there were many devices in use to-day in this country which had been devised by their own engineers which certainly did very much to improve the telephonic communication and at the same time cheapen the cost of the service. When he entered one of their large telephone exchanges, or even one of their repeater stations, he often pictured the different stages in which he had seen ideas which finally had produced the mechanism which their colleagues in the Operating Department were employing to so regularly and smoothly deal with the traffic. On these occasions he was reminded of Owen Meredith's lines:

"Not a truth has to art or to science been given,
But brows have ached for it, and souls toiled and striven."

It was on these occasions that the truth of these lines, as applying to the work of their own engineers, came sharply home to him.

Mr. NOBLE proposed and Mr. BABINGTON SMITH replied to the toast of "The Visitors."

Mr. BABINGTON SMITH said he could imagine very easily someone saying that the telegraph and telephone service could go on very well without a Secretary. (Laughter.) He could even conceive somebody suggesting that the machine would continue to work—if he might be permitted to whisper such a heresy—without a Postmaster-General. (Laughter.) But it could not get on without wires and instruments and without an Engineering Department to erect and maintain them. (Cheers.) He thought, therefore, he was not far wrong in regarding their service as perhaps the most indispensable part of the whole Post Office machine, and as that indispensable part they naturally expected great things of them.

Mr. H. R KEMPE, who was received with loud and prolonged applause, said he had very great pleasure in proposing the toast of their Chairman. Major O'Meara had always taken the very greatest interest in matters not only which concerned the department as a great State institution, but also in all matters which concerned the interests of the staff under his command.

Major O'Meara, in reply, said he felt that it must have been his destiny to come to the Post Office. He could remember it was nearly twenty years ago when he first came to the Post Office. After recounting the conditions under which he entered the Post Office, Major O'Meara said: On a later occasion, six years ago, I was in this country temporarily on leave. My leave was very much prolonged because I was asked to carry out some duties for the Government under which I was employed at that time, and that had a very fortunate result for me. Finally, the business I had to carry out was finished. I had gone into the Union Steamship Company's office and bought a ticket for South Africa. That was at one o'clock; at two o'clock my train was due to leave Waterloo Station. On my way there I came across the Consulting Engineer of the Post Office. He said: "What are you doing?" I replied: "I am going back to South Africa." He then said: "There is an appointment vacant at the Post Office which we want you to take. Haven't you heard about it?" I replied that I had not heard about the vacancy. Sir William Preece then requested me to postpone my journey, and see him again at four o'clock that day. I did so, and that is the reason why I am here to-night.

Gentlemen, I must say I have to thank you heartily for the very kind way in which you have supported me this evening. I do not think I need repeat how very much I have the interests of you all at heart, and I think you may rely on me to do the best for you all. (Applause)

TELEPHONE, THEN TRAVEL.

ONE of the favourite telephone catch phrases has been: "Don't travel, telephone." Now we have a variation that may become just as popular. Tickets and Pullman accommodations on the New York Central lines can be obtained by telephone or letter, under a plan just inaugurated by F. L. Vosburgh, general Eastern passenger agent. By this arrangement anyone can obtain tickets by a messenger who is authorised to collect for them and complete any other arrangements necessary for the comfort of the traveller. At each of the New York city offices of the Vanderbilt lines these messengers will be constantly on duty, making possible hasty preparations for travel at any hour of the day. Although New York is the best-equipped city in the world for the accommodation of the travelling public, offices of the various roads being located in all parts of the business district, Mr. Vosburgh says he has found that many persons who at times are hastily called away need still further aid in preparing for their trips. "We have inaugurated the plan to accommodate the busy traveller, and believe that the increased business will merit keeping it in operation," Mr. Vosburgh said. "There are many persons who find it necessary to arrange for their accommodation in their home, hotel, club or office. We have competent representatives, who on the receipt of a note or telephone call will be sent to the prospective traveller's residence or office. He will take with him the necessary tickets and Pullman accommodations, collect for them and make all other necessary arrangements for the comfort of the traveller."—*Electrical World.*

TELEPHONE WOMEN.

XIII.—JANE F. RENNIE.

MISS RENNIE, Teacher of the Operators' Training School, Glasgow, entered the Company's service in the Royal Exchange, Glasgow, on Jan. 23, 1891. At that time, compared with to-day, the exchange arrangements were of a primitive nature, the switchboard being of the hand-restoring indicator pattern, with operator's instruments of the Blake transmitter type mounted on standards and single pole receivers. A year later saw the introduction of the suspended transmitter with headgear receiver, which was found a very great improvement; the transmitter because it permitted of operating while standing, and the receiver because it allowed the free use of both hands.

In July, 1893, the present Royal Exchange switchboard was opened on the "call wire" system, and was an event eagerly looked forward to, as the load under the old conditions, due to want of accommodation, was becoming too heavy to admit of a good service being given. This time also saw the introduction of the operator's breast-plate transmitter. Unfortunately the "call wire" system did not herald the coming of an operators' or subscribers' paradise. This system of working continued until September, 1901, when the present ring-through lamp call-and-clear system was

JANE F. RENNIE.

introduced. At this time Miss RENNIE was appointed Clerk-in-Charge of the Argyle Exchange, a position she ably filled in the troublous time then experienced owing to the system being new to the subscribers and to the competition of the Corporation telephones.

In October, 1902, Miss RENNIE was promoted to be Clerk-in-Charge of the Royal Exchange, and until within the last few weeks she has held this position. On her appointment the staff numbered 66; it had increased by the time she left to 121. She had full control of this large staff, there being no exchange manager, and this in itself speaks well for her capabilities.

Miss RENNIE, as a supervisor, saw the birth of the opposition system in Glasgow, and much credit is due to her and the staff under her control for the good service given in the years of strenuous competition from which the "National" emerged successfully.

In January, 1905, two evening classes for the training of operators were instituted, and Miss RENNIE was appointed one of the teachers, and has carried out her duties as teacher in a manner meriting the approbation of her superiors.*

She embodies, to mention only one or two of her attributes, an even temper, a clear head and a thorough knowledge of the intricacies of traffic management. She has the faculty of imparting to others the knowledge she herself possesses, and instils in their minds the fact that conscientious attention to duty brings its own reward. As teacher of the day training school she will have twenty learners under tuition to provide for increase of staff and the replacement of those leaving the Company's service, and with an operating staff of 560 in Glasgow the changes are naturally pretty frequent. No position could be more important, as in the initial stage of an operator's career everything depends on proper training. Miss RENNIE pleads guilty to no particular hobby unless reading may be so classed.

* It was latterly recognized that, to obtain the best results, the teacher of these classes should be relieved of all other duties, and Miss RENNIE is now devoting her whole time to the Operators' Training School.

XIV.—MARGARET LAW.

As Chief Operator of Leicester the claim of Miss LAW to be a telephone woman will not be gainsaid. She was educated at the Wyggeston Girls' School and originally intended to be a telegraph clerk, serving one year in the Leceister Post Office before joining the Company. Starting as a junior eleven years ago Miss LAW has passed up to her present position by natural selection, having always seemed just to fill the bill for cheerfulness, orderliness, smartness, and tact in handling subscribers. She has served under four

MARGARET LAW.

District Managers and has fully justified her selection of three years ago as Chief Operator.

Miss LAW keeps a firm hand on the staff, and subscribers trust her to a marked degree. She has watched the steady growth of telephony in Leicester, and helped forward by her example of persistent attention a service which has increased considerably since 1896. In that year there were 700 lines on the exchange; they now number over 2,500.

Miss LAW believes in healthy outdoor exercise for everybody; her recreations are walking, cycling, skating, tennis and gymnastics.

AFTER THE GAMAGE FIRE.

IN order to mitigate as far as possible the serious inconvenience caused by the recent fire at Messrs. Gamage's huge premises in Holborn, London, it was necessary to thoroughly organise the staff of over 800 employees. This has been done so effectively that there is little trace remaining of what might have proved a catastrophe. Fifty of the men employed by the County of London Electric Supply Company, who supply current for lighting these extensive premises, have been at work night and day since the fire, and their assistance, along with that of the employees of the National Telephone Company, has greatly helped the management, who have congratulated both companie upon the smart work done by their servants.—The *Electrician*.

THE NEW MEASURED RATES.

Prize Essay BY JOHN A. CRAVEN, *Glasgow.*

THE telephone world as represented by subscribers in this country is at present suffering from an epidemic of distemper, which we believe is but transitory; indeed, there are signs that the convalescent stage has arrived.

When the malady was at its height we took great pains to discover the cause, and after much searching were able to locate some sort of bacilli composed of new measured rates, designed to work havoc among the unlimited patrons. They have not been hit so far, but they seemed to consider it best to cry out first, and afterwards to search at leisure for the trouble. The grievance, however, is hard to find. The Telephone Company merely decided that there should be an equitable levelling of the rates, a readjustment based on equity and equality, and surely there is nothing dreadful in the prospect of universal measured rates. They are, in fact, designed for the mutual benefit of Company and subscriber.

We know that "there is nothing either good or bad but thinking makes it so." It is surely well, however, not to proclaim a thing bad until experience has proved it to be bad. The three principal contracts which came into force some months ago were the direct line, the small private branch exchange, and the large private branch exchange agreements. An unlimited number of extensions are allowed on the large private branch exchange giving intercommunication between the primary instrument and the extensions. Ten extensions are the limit given on the small private branch exchange with intercommunication, but only one junction is allowed. On the direct line two extensions only are given, fitted with push buttons and bells, which arrangement does not permit of easy intercommunication. There are three parties concerned with the revision of the telephone rates, viz., the Company and Post Office (which are virtually one in this connection), the large user, and the small user. The latter has remained silent, evidently not realising that the benefits obtained by the large unlimited user are at his expense. We shall endeavour to point out some of the advantages of the new rates, and to give reasons why they should displace the old.

1st.—Unremunerative Unlimited Rate.—The unlimited rates were fixed for a system which embraced a small number of telephones. The number has since then multiplied many times, and the value has therefore been vastly increased to every patron. When the number of telephones was small the average number of calls per telephone was also small; while now, with a large number of telephones on the system, the average number of calls per telephone has greatly increased, consequently the expense of handling the business has also increased. It is surely reasonable, nay imperative, that the increment of value given to the unlimited subscribers by these additions every week be charged for.

2nd.—Ineffective Calls.—The proportion of ineffective calls is a great source of trouble and expense. Indeed they have long presented a problem which has only now to a certain extent been solved by the advent of the new measured rates. The provision of auxiliary and junction lines for a small rental is a feature of these new rates which from want of thought and indifference subscribers are slow in grasping. Were it possible to get the value in money of the business contained in these ineffective calls which have been lost to a particular subscriber, and to point out the rival houses to which that business went, the trouble would soon be over; but these particulars, as you can well understand, can hardly be procured. When the difficulty is explained in a general way the large unlimited subscriber immediately declares that these ineffective calls would be of a trivial nature, so accustomed is he to answering calls which are but "airy nothings." As a rule, therefore, the unlimited subscribers dislocate the traffic and increase the work and expense of operating.

3rd.—The Measured Rate System is a Tested System.—The new measured rate system is the result of much experience, and is not a mere venture, an innovation or ingenious scheme to impose on the telephone user. In America the measured service rates are almost universal. They are, in fact, the choice of the merchants there, and have therefore been adopted by all the largest telephone undertakings in the States.

4th.—The New Measured Rate Calls are Graded to Benefit the Large User.—We may come across the owner of a business upon whose mind the injustice and the delusive advantages of the unlimited rates have made an impression, but although he has become disillusioned, he naturally enough considers that he should not be expected to pay as much per call as the small trader. The charges meet his case exactly. The man who contracts for a direct line at £5 for 500 calls pays 2½*d.* per call. If he decides to take 1,500 calls he pays £8 10*s.* per year, which works out at 1¼*d.* per call, and he only pays 1*d.* each for excess calls, as against 2*d.* per excess call levied on those who contract for a smaller number than 1,500. If the agreement is a small private branch exchange the difference is the same, taking these two rates; if the contract is on the large private branch exchange basis the ratio of gain is as great. The rate for 3,000 calls is £8, while 9,000 calls are charged, not £24, but £20. The prices of internal extensions on large private branch exchanges are also fixed to benefit those who take a large number; for instance, up to ten 32*s.* each, from 40 to 60 24*s.*, over 100 20*s.*

5th.—Refunds.—Those who contract for a number of calls above the minimum and do not use them get a rebate in cash, or might we not call it a bonus, at the end of the year. The minimum number of calls is 500, and to get the benefit of the 1*d.* charge for excess calls, if they should be required, as already mentioned, it is necessary to contract for 1,500 calls or over this number. There is a strong inducement and a great benefit given here by the Company. A man signs an agreement with sufficient calls to carry him through a busy prosperous year. If business has been brisk, he feels the advantage of having contracted for a good supply of calls; if, unfortunately, business turns out poor he loses nothing by his telephone, for the Telephone Company comes to his aid and gives him back the equivalent in cash of the unused calls above the minimum. Is this not somewhat analogous in principal to the recent generous action of some of the large landed proprietors in the east of Scotland, who gave an abatement in rent to their farmer tenants because of the poor season?

6th.—The New System Provides for an Effective Service.—Measured rate subscribers get quality (if we can apply that word to the telephone message) as against the quantity given to the unlimited patron. Of course we do not mean to say that the unlimited subscriber is deliberately starved: he gets as good service as ever he got, but the measured rate subscriber gets better. As every measured call which does not get through is a loss to the company, the operator keeps in touch with the caller till he gets the connection.

7th.—The Old System Encourages Dallying at the Instrument.—"Ill habits gather by unseen degrees." In nearly every large establishment which has telephones on the unlimited basis, the employees go to them as they would to the water tap, and do not spare them or their own time. They have gradually got accustomed to do this, and know that the employer imagines that when they are at the telephone they must be giving or getting some message which will help business. Could an articulate echo of the message reach the chief's ears, he would suddenly become a strong supporter of the measured rates.

8th.—Conciseness.—It has been said that "he who sedulously listens, pointedly asks, calmly speaks, coolly answers and ceases when he has no more to say, is the fittest for business, and is sure to succeed." A measured rate telephone is wanted in that man's place of business.

Other aspects of the rates, with specific instances from the special circumstances of particular subscribers might be looked into, but the arbiter, *Time*, says "let the foregoing suffice." It might be well, however, to point to something which appeared along with the new measured rates, and which has been a bone of contention in some quarters, viz., the junction fees. All that can be said is this, that they can be easily justified on business grounds, and therefore the bitter must be taken with the sweet. Three miles radius from the centre of the city provides a large district in which to roam free from junction fees. This represents an area of over 28 miles, and roughly 78 miles when junction fees are paid. Surely no one would consider the facilities meagre for the moderate charges made. Yet, in spite of the elaborate and carefully arranged rates,

with facilities designed and suited to meet the needs of all classes, one hears day after day of the difficulty of getting everyone to appropriate them to the full for his business.

I will conclude with a word or two which savours perhaps a little less of eulogy than the foregoing. The telephone agreements are a very important part of the new measured rate service. The direct line and small private branch exchange forms are favoured by all, but I have heard it whispered that the large private branch exchange forms are somewhat formidable documents. I even fancy having sometimes heard them spoken of as death warrants. Indeed, to the large user who is not satisfied with his present connections, and is inclined to increase his facilities on a different basis, might not the sight of one of these rouse in him the feelings of Hamlet, and cause him rather to bear those ills he has, than fly to others that he knows not of. I may be wrong: I hope so. It is well to have agreements that "he who runs may read," and understand. To exemplify the need for simplicity I would give two extreme cases. As you are aware the line for the signature on the contract forms bears the words subscriber's signature printed at the beginning, the next line address, the third business or occupation, and the fourth date of application. It would not be possible, one would think, to indicate more clearly what should be filled in, yet one party sent in the form with the word "occupation" written in the third line, while a lady filled in the word "widow" opposite business or occupation. Truly there are many strange occupations.

METROPOLITAN STAFF DINNER.

THE annual dinner of the Metropolitan staff was held on Friday, March 6, at the Holborn Restaurant, the chair being taken by Mr. CLAY, assisted by Mr. H. DAVIS as vice-chairman. Among the visitors present were Messrs. S. J. GODDARD (General Superintendent), F. GILL (Engineer-in-Chief), W. E. HART, C. J. PHILLIPS, HERBERT LAWS WEBB, etc.

The CHAIRMAN in his speech reviewed the events of the past twelve months, alluding specially to the loss which the Company had sustained by the deaths of Mr. W. E. L. GAINE and Mr. C. M. BAILEY. He also expressed his pleasure at the unusually large number of social gatherings which had been held during the winter, because events of this sort, in addition to assisting the finances of the benevolent fund, also brought the staff together and so tended to promote good feeling and co-operation, which were so essential to the well-being of all and to the interests of the Company. Mr. GODDARD also took occasion to express in a few very happily chosen words his pleasure at meeting the Metropolitan staff for the first time since his appointment to the position of General Superintendent. He pointed out how important it was that there should exist between the Chief and his staff mutual knowledge and esteem one for the other, without which there could never be that confidence and co-operation, which were so essential to the success of a vast organisation like that of the Company to which it was their privilege to belong.

The health of the Chairman was duly proposed by Mr. DAVIS, who on rising had a most enthusiastic reception.

The musical portion of the evening's entertainment, arranged by Mr. W. R. PENSON, was given by the "Rouge et Noir" Concert Party. Mr. WALTER DANCE, of the Engineering Department, also contributed two very enjoyable items to the programme.

AIDS TO PHILOSOPHY.

COMPILED BY T. J. CLARK.

1. Good temper oils the wheels of life.
2. Justice consists of giving to every man his due.
3. At your post be masterly, and be master, but not masterful or overbearing.
4. We best prompt others to their duty by devoted attention to our own. Enthusiasm begets enthusiasm.
5. It is not sufficient to do what we can; we must strive to improve our powers of doing.
6. All true knowledge is the result of experience and observation.
7. He who never makes a mistake, never makes anything.
8. There may be more right ways of doing a thing than one's own.
9. Of learning there is no end.

THERE'S SOMETHING IN IT!

BY GEORGE W. LIVERMORE, *Divisional Contract Agent, London.*

THIS phrase has ever been the herald of something new, not new to the world at large perhaps, but new to him whose grudgingly conceded admission points plainly to the fact that something good is happening in which he is not yet participating. It has been, and will still be the cry of many, as science in its onward march harnesses the natural products of prolific Mother Earth in the interests of progress.

A little band of men, undaunted in the face of strong opposition, gave us the railway; the pioneers of coal gas saw their efforts belittled and ridiculed. Gradually there was found to be "something in it," until we in our generation wonder how on earth people managed without such necessaries.

So with TELEPHONY. The infant of yesterday is growing by leaps and bounds, simply because the public are finding that there's "something in it."

As in the case of prior scientific innovations, the most common stumbling block is apathy. The man who is unconcerned must be taught that apathy spells stagnation. We of the contract staff must be able to move that man from his position of self-satisfaction. Read him statistics of the development of telephony in this country, and if he be a man whose pride is in his business the figures will set him thinking. If such progress is being made, why is he not joining in? Perhaps he will count up his immediate circle and find but few who are subscribers. Very well! But what is one man's immediate circle? It is usually small, though perhaps that circle has supported him for years. That was under the old order of things. A new order is spreading; the circle must widen to such an extent that in the race for commercial supremacy an ever open channel shall be kept in every direction by means of which new friends may join in.

He will tell you that his is an old conservative firm. So it was when his ancestors looked askance at the quickly developing railroad. And yet, would he have the courage to support his contentions to the extent of a coach journey, say, to Manchester, in the olden style along the turnpike road? Three days instead of three hours? I think not. Such conservatism is meaningless; it has no substance and no logic.

Perhaps he objects to poles, wires and the other necessary adjuncts to electric message transmission. So did his fathers when the railway cuttings appeared, "desecrating," as they termed it, Nature's verdant pastures. But still, he does not shudder when journeying in comfort for his own benefit along the lines through the meadows. He is not even disgusted to think that his goods may be dispatched in the evening from one end of the country and reach the other end by the morning, winning him a reputation for promptness.

Invite him to consider, and he will surely agree that there can be no desecration where the general interests of the community are being served; he will surely see "something in it."

And so with every conservative and obstructive argument brought forward; there is its answer, and obstructions to progress will most certainly meet with the same fate as did Stephenson's "coo."

"Something" in it, indeed! There is *everything* in it. To-day a man *may* subscribe to the telephone service, but the day is not far distant when he *must*.

SMART CONTRACT WORK.

A SMART piece of work was effected by one of the Liverpool contract officers on Nov. 12. On calling at a subscriber's office at 11.30 a.m. in connection with a small removal matter, he found that the subscriber was equipped with an unlimited service line with one extension, and promptly broached the subject of measured service and the advantages of a private branch exchange. The subscriber, however (who represented a limited company by the way) would not hear of it at all, but the contract officer, metaphorically speaking, "cleared for action," and succeeded in getting one of the directors of the company to put the matter before his colleagues at a meeting which was to be held before noon, and at 1 p.m. had the satisfaction of coming away with a contract for a private branch exchange, consisting of two junctions and four extensions with 3 000 calls. Such expedition is in striking contrast to the work usually involved in obtaining private branch exchange orders, and shows the advantage of "striking hard and often" at the prejudices of subscribers who think the flat rate the *only* rate that is worthy of their consideration.

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"BY THE STAFF FOR THE STAFF."

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THE FORTHCOMING MEETING OF OFFICERS.

AT an early date, yet to be fixed, an event of great interest to all classes of the staff, the Annual Meeting of Officers in London, will take place. The papers prepared for the meeting abandoned under such unhappy circumstances last year will be read in a revised form at the forthcoming gathering. That the three papers on the subject of the "Measured Rate Service" and the six critical essays thereon will have gained enormously in value by the experience afforded by a further and somewhat crucial year's working nobody will deny. As these rates affect alike the accounting, clerical and contract staffs much valuable knowledge must have been gained in the past year, which has seen the measured principle of payment widely and successfully extended.

The benefit of an interchange of experience and ideas is more far-reaching than the reading of twelve papers and the conferring together of some 200 officials would portend. The selection of a competent official to write a paper on a subject within his peculiar ken, and the submission of such paper to the deliberate criticism of two other especially suitable officers ensures that the maximum of profit is derived from such subject in the time allotted to it. But, of course, the criticism of a paper does not end with the pre-arranged studied comments on it. It is further subjected to the spontaneous criticism of any member of the staff present at the meeting; and, more than this, the views of all the staff up and down the country are brought to bear upon each paper through the medium of those attending. Such criticisms are welcomed; not indeed at any length, for time is valuable when there is much business to discuss, but in the shape of brief suggestions and useful points such as occur from time to time to the thoughtful. In the comprehensive subject of the measured rate service, there is something upon which the daily routine of every clerk, every operator and every contract officer touches, and the subject of aerial cables is near to the thoughts of all the varied grades of engineering staff both indoor and out.

It is for many reasons impracticable for a larger number than is at present invited to be in London for the annual meeting. Those officials attending therefore, are in a sense delegates for their district and spokesmen of the opinions of those who are not invited, and as such their criticisms have a double significance.

In view of the enthusiasm with which the meeting has always been imbued and of the interesting character of the projected subjects, we see every reason to anticipate a successful and beneficial meeting and that the confluence of so many varied ideas will result in advantage to all members of the staff and ultimately to the public.

FRIVOLOUS CALLS.

IN the vast quantity of ink-spilling which has lately taken place on the telephone question the expression "Frivolous calls" has loomed somewhat largely. It is one of those phrases which is coined for want of a better, and being misunderstood has provoked indignant remonstrances that telephonic conversations on social or private affairs should be classed as frivolous in comparison with the conferences of business men over the wires. Were sordid mercantile affairs, it was half suggested, the only matters of real moment in the eye of the telephonist, and were all other aspects of life considered as things of no importance? This, however, is far from being the sense in which the term is to be understood, and indeed it is self-evident that the wider extension of the telephone among private houses for which all telephone administrations are striving would be undesirable, if the majority of calls originating from such connections were considered to be frivolous and accordingly discouraged. We are, indeed, past the stage of development when the quotation of stocks, shares and market prices, the giving and cancelling of orders, and similar business transactions formed the staple of telephone traffic. The social use of the telephone is now widespread. Invitations are given, engagements of all kinds are fixed, shopping is done, and social enquiries are made over the wire. It is not contended that the issuing of an invitation to dinner is a frivolous, and the business transaction of ordering a pair of fowls from a tradesman for the same dinner a serious call, nor is that husband frowned on who rings up his wife to inform her of the time at which he will reach home. It is, in fact, obviously a matter of indifference to a telephone administration what purpose the telephone is used for provided the subscriber needs the call sufficiently to be prepared to pay the customary charge for it. But there comes the rub! The frivolous call first arose and thrived amongst the subscribers whose payment covered an unlimited amount of service. However often his manservant and his maidservant, or even his ox or his ass, if it were possible, used the telephone, he would pay no more for it. Hence these myriads of ten minutes' long chats concerning last night's dance, this endless discussion of football clubs' chances, this multiform light badinage, this use of the telephone to pass the time pleasantly, all of which occupy the lines, perhaps long and expensive ones, to the exclusion of non-frivolous calls, not only of a business nature, but also legitimate calls making social appointments, and indeed conveying any sort of message where the most rapid method of communication is desired.

STATISTICS.

SIR WILLIAM PREECE in a lecture delivered at the Institution of Electrical Engineers on "America Revisited," gave some interesting statistics of the development of the telephone in the principal European and American cities :

	Population.	Telephones.	Telephones per 100 population.
New York	3,437,202	279,047	8·12
Chicago	1,698,575	126,436	7·44
Philadelphia ...	1,293,697	95,914	7·41
Berlin	1,888,848	83,824	4·43
Paris	2,660,559	62,370	2·34
Vienna	1,674,957	27,541	1·64

In comparing London with these cities, the statistics for the whole of the London telephone area are included, giving a proportion of telephones per 100 inhabitants of 1·98. As we had occasion to point out some time ago it is obviously to the disadvantage of London to compare its telephone area (which far exceeds all the recognised boundaries of London) with what are in most cases not much more than the municipal areas of other cities. For instance, we know that there are over 2,000,000 inhabitants and over 100,000 telephones in Greater Berlin. Kingston, Epsom, Reigate, Tilbury, Sidcup, Waltham Cross, Romford, Enfield and Harrow are not London in any but telephonic geography, and if we take the County Council area (and even this includes such outlying places as Plumstead, Eltham, Roehampton, and Tooting Graveney), we shall find that it possesses about 135,000 out of the 148,000 telephones in Greater London, with a population of four and a half millions, which is a proportion of three to each 100 inhabitants.

NOTICES.

CLOTH binding cases, price *1s. 6d.*, can now be obtained for binding Volume II. Portraits of Mr. HARE, price *6d.*, are ready, and those of Messrs. W. A. SMITH and R. A. DALZELL are on order. Readers whose sets are incomplete can obtain any back numbers (with the exception of April, 1906) on remitting *3d.*, or *4½d.* if it is desired to receive the copy by post.

The attention of correspondents is again called to the fact that staff news received later than mid-day on the 20th of the month can in no case appear in the next issue of the JOURNAL.

A WORD OF PRAISE.

PROBABLY no invention placed at the disposal of man for his benefit and convenience, says the *Birmingham Daily Mail*, has been more heartily abused, and at the same time universally used, than the telephone. The newly published figures reveal the fact that in the Metropolis alone 250,000 calls are made daily, which works out at about 90,000,000 in the year. Added to this there are evidences of a huge increase in usage over last year to the extent, in fact, of nearly £100,000. It is really time something was done to stem the stream of language which is habitually levelled at the head of this instrument to its painful detriment. There is no doubt that the vocabulary of men in many instances has been somewhat extended since the introduction of the telephone. It is the non-transmitted speech to which we particularly refer, and the above figures make it practically incumbent upon commercial humanity to treat so great a convenience more as a friend than a deadly enemy, and use it "after its own deserts."

JUDGE AND TELEPHONE.

SINGULAR INCIDENT AT LEEDS ASSIZES.

AT Leeds Assizes yesterday, says the *Sheffield Daily Telegraph* of March 20, Mr. JUSTICE CHANNELL mentioned that in a case in which the jury's verdict was returned after he had left the court the previous evening a novel form of judicial procedure had been taken. The Associate had telephoned to him the attitude taken by the jury, and it was on his sending a message to the jury that they returned a verdict.

GLASGOW CORPORATION TELEPHONES.

A DIFFERENCE AS TO PURCHASE PRICE.

THE following paragraph from the *Glasgow News* sets out the true value of the Glasgow Corporation telephone system to which certain of its sponsors still point with pride.

The Civil Service Appropriation Accounts, issued yesterday (Feb. 26), contain a report by the Comptroller and Auditor-General, in which he says: Under agreement dated Sept. 6, 1906, the Postmaster-General purchased the Glasgow system as from June 1, 1906, for a sum of £305,000, with interest to date of payment. It appears that in the first instance the Corporation claimed £322,000, and upon refusal the property was revalued on both sides. The valuation on behalf of the Corporation was returned at £311,083, while that of the Engineer-in-Chief to the Post Office was £266,087 only. As the amount paid, £305,000, was so largely in excess of the value of the undertaking as estimated by the Department, I asked for an explanation of the circumstances in which this sum was agreed upon without recourse to arbitration, a method of procedure for which provision had been made on the termination in December, 1913, of the Postmaster-General's license to the Corporation. The Postmaster-General, in reply, stated that as the purchase of the system was by mutual agreement, and not under the terms of the license, it was not possible to require the Corporation to refer the question to an arbitrator. The amount of revenue due from the Corporation outstanding on March 31, 1907, was £7,854 0*s.* 1*d.* of which £5,185 6*s.* 3*d.* was paid over on Nov. 3 last, leaving the balance still in dispute.

RECORDING MELODIES BY TELEPHONE.

THE method of selecting and operating apparatus, says the *Electrical Engineer*, either mechanically or electrically, by means of bodies tuned to different frequencies of vibrations is applied by the Felten und Guilleaume-Lahmeyerwerke A.-G. (according to a recent patent) to various systems of telegraphy and telephony, and is also stated to be applicable for recording melodies in musical notation or speech in ordinary letters. In party line telephone systems each station is provided with a simple generator, in which a pole-wheel revolves between the coils on the pole-pieces of a permanent magnet, and also with a series of tuned springs mounted on a common base exposed to the action of an electro-magnet through which the generator currents pass. To send a current of the frequency necessary to call a certain station, the speed of rotation of the generator crank is increased until the spring corresponding to the station to be called is vibrated, and at this moment the line circuit is closed by a separate key. This method of selective calling and operation may also be used in divided board exchange systems, in automatic exchange systems, and in multiplex harmonic telegraphy. Several generators of different frequencies may be arranged at different points in a single circuit, as in a fire-alarm system, the calling station being indicated at the central station by its corresponding spring. In the application of the invention to printing telegraphs the transmitting generator has several pole-wheels with different numbers of poles, so that, on depressing one or several keys, one or several currents of different frequencies are sent to line. One or more receivers of the electro-mechanical typewriter type may be connected with a single line. An intermittent direct current may be used instead of alternating current. At the receiving station the tuned bodies may be vibrating tongues strings, wires, etc., or hollow bodies filled with liquid or air or other gas. The current impulses may also be generated by means of microphones, which may be set in action in any suitable manner—*e.g.*, by sirens or tuned whistles. By using a suitable typewriter, melodies may be printed in musical notation or speech in ordinary letters.

HIC ET UBIQUE.

OUR explosive Sunday comic contemporary *Reynolds'* has something to say about the Telephone Trust, meaning the National Telephone Company. It wants to know if it is not really a confession of inadequacy in the Company's arrangements that certain subscribers' lines are blocked because they use them excessively. We should really like to know how. Would the Company's arrangements be considered adequate if they could magically transform one line and instrument into three whenever two people wished to communicate at once with a given subscriber who was already using his telephone. Does the sober and less sensational method of a man's paying for three lines whenever his traffic requires three lines not commend itself to *Reynolds'*?

THE *Gloucestershire Echo* gives an interesting account of a scheme initiated by Miss WOODHULL, of Bredon's Norton, to brighten village life and avert the rural exodus to the towns. This is the connection of that hamlet with Bredon by means of two junction lines with six stations and placing the village in communication not only with Bredon, but with Cheltenham and Tewkesbury, without paying trunk fees. "Her reward," says the *Echo*, "will be in seeing that the system proving her theory that in this direction lie great possibilities in the development of rural industries and the fostering of the amenities of village life."

A CORRESPONDENT forwards us the enclosed verses, informing us that printed on card they used to be attached to the instruments of all subscribers of the old West of England company:

"Speak softly through the telephone,
Just modulate your tongue,
A soft clear voice is better far
Than Stentor's brazen lung."

"Don't hollo through the telephone,
And rage and shriek and roar,
You'll hurt yourself and do no good;
Oblige by speaking lower."

We are inclined to say of the verse, with Touchstone, "Ill rhyme you so eight years together, dinners and suppers and sleeping hours included," but the advice certainly seems to be good.

THE extraordinary story told at an inquest at Hackney where a son stated that his father was killed by a flashlight from the National Telephone wires overhead is another example of the delusions about electricity and the telephone in particular which half-mad people possess. "They set a secret inlet of wires into his body," declared the witness, "and by that they flashed the wires and then drew the wires to all parts of his body, with the result, of course, it destroyed life. To tell the truth, the thing originated at Hampton Court Palace two years ago on Easter Monday."

The natural incredulity of the coroner evoked a letter of protest from a gentleman at Dunstable, who said he was "ionized" up to 75,000 volts by nefarious processes. The *Medical Press* in commenting on the cases says that the danger of electricity conducted by wires is a form of delusionary insanity familiar to all who have to deal with mental disease.

[*Drawn by* E. J. CLARKE, *Brighton.*

"Dangerous things, them motors—wouldn't trust myself on one."

COMMUNICATION.

(Reproduction Prohibited.)

WE exist to provide communication, and the importance of our duties to the community was well illustrated by the writer on "Evolution" in the September issue, quoting Lord Macaulay:

"Those inventions which abridge distance have done most for the civilisation of our species."

In endeavouring to give some details of the history of the Posts which in the early times provided the means, the writer hopes to receive information from members of the staff which will assist him to make the record more complete, and all communications sent through the Editor will be appreciated and gratefully acknowledged.

The first letter of which I have found any record is that by King David, sent 1035 B.C., by Uriah the Hittite, and is of fateful import, as the messenger was constituted by it the conveyer of his own death warrant. It was addressed to Joab, instructing him to put the bearer in the forefront of the hottest battle, and to retire from him that he may be smitten and die (2 Sam. xi).

In the days of Hezekiah, 700 B.C., there must have been some organisation for the carrying of government letters, for in the Chronicles of the Kings it is written, "The Posts went with the letters from the king and his princes throughout all Israel." This is the first mention of Posts I have found.

In Esther viii, 10 we read: "He wrote in the King Ahasueras' name and sealed it with the king's ring and sent letters by post on horseback and riders on mules, camels and young dromedaries."

By the bye, no one need report that the first mention of the "male" is in Genesis.

Writing was familiar in the time of Archilochus at Sparta, and elsewhere in Greece, about 714-676 B.C. The practice was to write upon a long narrow strip of parchment after it was rolled in a spiral round a staff, the Spartan Government using this means to communicate with their generals, who were provided with a staff of precisely similar dimensions, and on receiving the parchment rolled it round their own staff for the purpose of reading.

The Posts at these times were for State use only, until diplomas were issued by the Roman emperors, by means of which, Pliny (A.D. 23-79) says, any person might command the use of horses or couriers.

This diploma may therefore be looked upon as a prototype of our postage stamps.

The couriers of the Aztecs wore dresses denoting respectively good or bad news. The Peruvians' dispatches were conveyed by means of the quipus, an arrangement of a cord composed of different coloured threads twisted together, from which a number of smaller threads were suspended in the manner of a fringe. The colours denoted various objects—white represented silver; yellow, gold; etc.

The earliest date in modern European history at which postal service is mentioned is [illegible], when an organisation was planned by Charlemagne. Louis XI is said to have employed 230 couriers, but it was not until the seventeenth century that these Posts became public. The first regular European Post was established in the league of the Hanse Towns.

The state of England was such that even ownerships was undefined till Doomsday Book survey about 1080-5.

No hedges, walls or divisions existed. There were no roads, only pack horse tracks.

The earliest and simplest means of communication were by beacon fires.

It is impossible to tell whether any organisation existed in Britain under the Romans. The General Posts date from the time of the Stuarts. The regular Riding Post in England owes its origin to Edward IV, 1441-83. Even when the Tudor dynasty came in, trade with foreign countries was almost unknown; I presume to some extent England was later in the field on account of its isolated position.

Henry I, 1100-35, first permanently employed messengers.

In Edward III's *régime*, 1216-72, these messengers began to wear livery.

Edward I first established fixed stations, Posts, or *Posita*, at which couriers and horses were kept for hire, and from these the Post in England took its name.

Edward IV considerably improved the Posts, and in his time the couriers travelled at the rate of 100 miles a day.

In the Formum there exists a post or monument showing the distances to various places.

Henry VIII endeavoured to keep the Posts in a state of efficiency, and in 1515 instituted the position of Master of the Posts. Sir Biram Tuke was appointed, and succeeded by Sir William Pagett and John Mason.

When the Government required horses for a messenger, a warrant was issued to all mayors, sheriffs, constables, etc., on the route. The following was issued in 1541:—

"Forasmuch as the King's Majesty sendeth his bearer James, one of his Majesty's pursuivants, into these parts by post, upon certain of his Majesty's affairs, his pleasure and high command is, that you see him furnished of post horses from place to place, both outward and homeward, at reasonable prices, as ye care for His Majesty's pleasure, and as ye will answer for the contrary at your peril."*

The bad people of those days were very like those of the present generation. We find Sir Biram Tuke reporting: "Not taking upon me to excuse the Posts, I will advertise you that I have known folks which for their own thanks, have dated their letters a day or two before they were written, and the conveyers have had the blame."

This showed the necessity for postmarking letters with a date stamp.

The Council of Edward VI, finding irregularities existed in the hire for post horses, passed an Act, 2 and 3 Edward VI, fixing the charge at 1*d.* per mile.

In Queen Mary's reign all the postmasters between London and the North "should each of them keep a book and make entry of every letter, showing the time of delivery thereof into his hands, with the party's names that shall bring it into him."

This decree is somewhat akin to a system of registration.

In Queen Elizabeth's time "extraordinary posts" were established to places off the main roads, and were the prototype of the 1838-40 1*d.* and 5th clause Posts.

Soon after the arrival of the Flemings in this country, about 1514, they established a post office and post of their own between London and the Continent, and later pretended a right to appoint a master of the Strangers' Post, but in 1558 they fell out amongst themselves and referred the matter to the Council; but by the influence brought to bear on the Government by the English merchants it was settled that there should be one Master of the Posts, under the title of Chief Postmaster, and Thomas Randolph was appointed. The Strangers' Post was the first institution of the Foreign Post.

Up to this time horses afforded about the only means of transit. The first mention of any kind of conveyance was in the *régime* of Richard II, 1377-1400. Stow says: "The king rode from the Tower to Mile End with his mother, because she was sick in a "whirlicote"—a beautiful and very expressive word—and adds, "for the world runs on wheels with many whose parents were glad to go on foot." In 1608 a kind of stage coach was first used in London. Stow tells us the coach was reintroduced into England in the reign of Mary, when Walter Ripon (possibly an ancestor of Messrs Rippon Brothers, of Leeds), made a coach for the Earl of Rutland, and in 1564 the same artist made the first hollow turning coach with pillars and arches for Queen Elizabeth.

It is an instance that no national calamity is an unmixed evil. Scotland owes one of her best turnpike roads to General Wade and the Rebellion, as the distich on the obelisk at Fort William reads:—

"Had you seen this road before it was made,
You'd lift up your hands and bless General Wade."

The letters of the period were most carefully folded, and fastened at the end with a sort of paper strap on which the seal was affixed, under which a piece of thread, or perhaps straw, was frequently placed and passed round the letter. These letters were frequently endorsed by the successive postmasters.

Here again is another system resembling registration.

By the courtesy of Mr. J. Eliot Hodgkin, F.S.A., I am able to give the inscriptions on a letter of the 8th May, 1654, from Admiral Blake, on the front:

For the speciall service of the State
For the Right Honoble. the Commrs. for
the Admlty. and Navy att
Whitehall.
hast Post hast,
hast wth. speed Rob. Blake.
Soveraigne off of Folston ye 8th May 1654 att
4 in ye Afternoon.

On the back of the letter:

Dover post hous at eayt at night.
Received at Canterbury past ii at night.
Received at Sittingborne past three in the morning.
Recd. att Rochester past 6 in the morning.
Received at Dartford past 10 in the morning.
Received in Southwark past 2 afternoon.

It was reserved to the Stuart kings to organise for the first time a regular system of Post communications. Two kinds of Posts were established in James's reign, known as the Through Post and the Post for the Packet. The first consisted of special messengers who rode "through post," *i.e.*, through the whole distance with horse and guide, and was established in 1603. For the Packet Post every postmaster was bound to keep not less than two horses ready, and to send on the packet within a quarter of an hour.

The first newspaper, the *Weekly News*, was printed in 1622.

The following is a curious and interesting contemporary notice which Mr. Hodgkin has been good enough to give me, and which has not before been published:—

"All gentlemen, Merchants, and other persons may please to take notice that upon Tuesday night the eighteenth day of January 1622, the letters were sent from the old Post House (at the lower end of Threadneedle Street by the Stocks in London) at the rates of Twopence, the single letters within eighty miles of London, and Threepence, the single letter within eighty miles within the Commonwealth (usually sent into) and so proportionately for double letters and packets, and packets of Printed Books, of two shillings the pound; and the State Packets and Letters carried free. And so to continue going forth Tuesdays and Saturday nights, and answers were expected Mondays and Friday mornings as formerly accustomed. And letters may be received in for conveyance by the old Post at these rates, at the several places accustomed, viz.—At Mr. Bartholomew Haggets, at the Sarigans Head in Westminster [here follows a list of further places]. The persons that have letters at any of these places, are desired to bring them in thither before ten of the clock, Tuesdays and Saturday nights, and at the Post House by the Stocks by Twelve a clock."

In 1629 there arose a difference between His Majesty's Post of the Western stages between London and Plymouth and Samuel Jude, calling himself the "Travelling Post," for the dispatch of merchants' affairs between the said places.

The complaint of the Post was that, under pretence of carrying private letters only, he (Jude) endeavoured not only to appropriate the sole carriage of all merchants' letters, but had taken upon him and used speedy carriage of men and packets on horseback in the nature of a Post, to prevent the Posts from carrying the letters of any merchants willing to employ them; he had caused

* It is such notices as these that the writer is desirous of acquiring and any information given to the Editor will be esteemed.

their bills at London and Plymouth to be pulled down. Thereupon the Lords of the Council ordered Jude not to undertake more than he was licensed to perform.*

The king created the office of Postmaster-General for Foreign Posts, and appointed Matthew de Quester the Elder and the Younger. On the death of the Younger, the Elder substituted William Frizell and Thomas Witherings. The latter proposed in 1635 to King Charles's Council to settle a pacquet post between London and all parts of His Majesty's domains. This is the first proposal made in England for a Public Letter Post.

In 1635 Bye-Posts were established to connect the main line of Posts to other towns, and in the same year the first regular Post was established in Scotland between Berwick and Edinburgh.

In 1637 the monopoly of letter carrying was first established by proclamation, an exception being made as regards places to which the Government Posts did not carry.

In 1640 Witherings was succeeded by Philip Burlamachy. Matters, however, did not run smoothly, and in 1644 Edmund Prideaux succeeded Burlamachy. I may say here that the frequent changes were to a great extent owing to political events.

* Any information regarding this given to the Editor will be esteemed.

(To be continued.)

STORMS IN SOMERSET AND WILTSHIRE.

BY ALFRED PERKINS, *District Manager, Bristol.*

A VERY severe snowstorm unfortunately passed over this district during March. About 50 wires were brought down in Bridgwater and 50 in Taunton on Feb. 29, together with two chimneys at Bridgwater. Most of the lines were in working order by March 1, and every one was through by March 3.

Another snowstorm passed over Wiltshire on the evening of March 3, doing considerable damage. At Calne the whole of the wires in the town were brought down, together with a standard which completely doubled up. Practically the whole of the junction line to Chippenham was also brought down, some of the

poles lying over at an angle of 45 degrees. At Marlborough, nearly the whole of the subscribers' wires were brought down. Swindon and Wroughton also suffered severely. The junction from Swindon to Wootton Bassett was completely wrecked; in some places the poles were torn out of the ground and were floating about in the water. The junction lines between Devizes and Bradford-on-Avon were also completely wrecked for over three miles; fortunately the poles stood well.

There were a good many other wires down in the various towns, but not to so serious an extent as in the cases I have mentioned. All the subscribers' lines and junction communication were restored by March 11; but there is, of course, a good deal to do, especially with regard to the junctions between Devizes and Bradford-on-Avon.

To cope with the difficulty, gangs were sent from Bristol and Bath, and the local manager from Bath and an engineer from Bristol, together with the Trowbridge local manager, did splendid work in looking after the men and restoring communication as quickly as possible.

I attach photograph of the standard at Calne.

CARDIFF OPERATORS' THRIFT CLUB.

BY W. J. MARSH, *Exchange Manager.*

THE fifth annual general meeting of the above club was held on Oct. 22, 1907, for the purpose of electing officers and committee for the year 1907-8. The members thought it would be of special interest if a report was sent for insertion in the JOURNAL, particularly as the results of the club have been so satisfactory.

The cash transactions for the four years ending Sept. 30, 1907, are as follows:—

	Deposits.	Withdrawals.
First year—		
October, 1903, to Sept. 30, 1904 ...	£81 14 6	£64 10 0
Second year—		
October, 1904, to Sept. 30, 1905 ...	100 9 6	92 15 0
Third year—		
October, 1905, to Sept. 30, 1906 ...	90 16 9	87 8 9
Fourth year—		
October, 1906, to Sept. 30, 1907 ...	122 12 6	121 3 6
		365 17 3
Balance in hand ...		29 16 0
	£395 13 3	£395 13 3

The club has a total membership of 40 (exclusively operators), and commences the fifth year with a balance (without interest) of £29 16*s.*, which is the largest amount it has yet had to carry forward since its inauguration.

The year just closed has been a record one, the average deposits per member being £3 1*s.* 4*d.* As the account with the bank is, so to speak, a floating one, the interest received is only small, averaging about 15*s.* per annum, yet it has been found useful in many ways, although most of it has been devoted to charitable purposes, the Cardiff Infirmary having benefited to the extent of £2 2*s.* up to date.

Several of the members have said how very beneficial it has been to them in saving their money in this way.

We are looking forward to another successful year.

CORRESPONDENCE.

LATE WORKING.

TO THE EDITOR THE NATIONAL TELEPHONE JOURNAL.

SOME months ago Mr. E. J. Fraser wrote a somewhat laboured epistle on this subject, which, so far as I know, failed to provoke criticism. He burst forth into an enthusiastic condemnation of the late worker; he even ridiculed him.

I have heard it said more than once that late working is due to one of two causes—either the man is incompetent, or he has too much to do, but this is not the case. The causes are varied, and each case must be thoroughly investigated before the root of the evil can be traced. One common cause is faulty supervision and organisation on the part of a man's immediate superior. I have come in contact with men in responsible positions who, to suit their own crude and primitive ideas of organisation, practically double the work, with obvious results. His assistant or assistants are burdened unnecessarily, and perforce have to do what they can to keep abreast of the work, although in different circumstances they would not have more than a day's work to do in a day. In a case of this kind the sufferer or sufferers are deserving of the most sincere sympathy, not the contemptuous ridicule Mr. Fraser would deal out to them.

Again, how often does it happen that a man in a low state of health has not the energy and strength to do all he should do in the ordinary day, and who would, rather than be obliged to ask for assistance, put in late working? Surely in such circumstances it would be a gross injustice to stamp a man incompetent.

Late working is to be prayed against, but let its cause be traced before the individual or individuals are condemned.

Edinburgh, Feb. 19, 1908. R. B. RAE.

CONTACTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I THINK it would be most useful if the views of the different engineers could be arrived at as to the necessity or otherwise of good regulation for the purpose of preventing contacts, etc., especially during such weather as we have experienced of late. There are a number I know who consider that contacts will occur, during high winds, whether the wires are in good regulation or not. I have had a little experience, and I maintain that it is most essential to have wires in perfect

regulation, to prevent contacts at all times, except after a heavy fall of snow, when the bottom wires being relieved perhaps first spring up into the wires above.

It is of course understood that to ensure good regulation all poles must be held in their proper position. This is not done in many cases. It is hard to credit that some belong to the Company. They are badly stayed, where there is ample room to have had any amount of pull.

The loops to subscribers' houses, etc., are a fruitful source of complaint. These again arise wholly through bad work. I once saw a piece of wood lashed across a pair of wires to prevent contact. Of course, this was effectual, but not a plan to be followed. Another subscriber was asked to shake the wires apart with a prop. This shows plainly that regulation is required. Had the wires been pulled up properly there would be no need either for the prop or the piece of wood.

In conclusion, I hope you will not consider it presumption on my part to give my opinion, perhaps against the majority of the engineering staff, I only hold a subordinate position, yet even so I am firmly convinced that if my idea is good, and if the staff were made to do their work properly, there would be more pleasure with subscribers and less work for the linemen.

Blackpool, March 12, 1908. E. SHINN.

PROMOTION BY COMPETITIVE EXAMINATION.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

A potboy or a labourer before he can reach the rank of foreman must pass several examinations (*vide* Service Instructions), but a foreman may be promoted to the position of an assistant engineer, or engineering inspector, without undergoing any such test of his abilities.

To-day the responsibilities of an assistant engineer are such that only qualified men should fill the position, and a man's qualifications are best sbown by examination. It is assumed that men already holding this rank are competent, and my proposal deals only with the filling of vacancies.

It will be generally admitted that it is not even desirable that a man go through the various grades of outside labour) gain the experience required. The practical work may readily be acquired by observation, and the competent observer, who has a sound general knowl dge of telephone engineering, mechanics, and mathematics is undoubtedly he man best suited for the job. My proposal is that the likely men in the di rict (if there are none, then the likely men in some other district) should be set a practical competitive examination for vacancies as they crop up. What a strong incentive to study it would be to those holding inferior positions, and the earnest worker is the man who would probably succeed. A clerk might prove the successful candidate, and it would probably be argued that he is not the man to climb a pole or be on a roof. Rubbish! A clerk would, with a little practice, be quite as much at home up a pole as the average wireman.

To illustrate my proposal I have concerned myself only with the position of assistant engineer, but it is more or less applicable to all grades of the various departments of the service. There is nothing which brings better results than active competition, and there is no fairer method of promotion.

Edinburgh, Feb. 19, 1908. R. B. RAE.

POWER PLANT COMMON BATTERY EXCHANGES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the February number the end of p. 223 reads "Charging accumulators. It should be noted that the possibility of the danger of repeated small overcharging is rather large," etc.; and on p. 224 "For the welfare of the battery a complete discharge should be taken occasionally," and "Persistent overcharging leads to loss of acid and low specific gravity."

I waited till the March number of the JOURNAL came to hand expecting to find the above statements corrected, hence this belated letter.

Is it not exactly the opposite, overcharging if prolonged even causing no harm to the plates or weakening the specific gravity of the electrolyte? Completely discharging on the other hand tending to cause the plates to sulphate and buckle especially if allowed to stand in this condition for any length of time on account of weakness of acid in electrolyte.

Re the Cadmium test, could Mr. Milnes kindly point out the advantages of this method, as from the description it seems as if it would be much easier to take readings with an accurate voltmeter? J. R. G.

[I must thank J. R. G. for his remarks, which draw attention to interesting points which will well bear a little amplification. I would point out, however, that none of the statements in my paper to which he refers require correction but rather emphatic assertion.

Overcharging is deleterious for the following reasons:—If repeated too often it leads to "forming" of the lead framework of the positive plate under the active material, causing the supports of the plate to be eaten away, and leading to disruption and consequent mechanical weakness of the plate if continued. It should be noted that in a plate continually overcharged the active material "grows" and bulges out in soft excrescences. The loss of acid and resultant low specific gravity consequent on overcharging without full discharge is due to two causes:

(*a*) Repeated "gassing" and loss of acid spray, which is replaced by water only when "topping" up.

(*b*) Internal absorption of sulphuric acid by the positive plate, amounting to "sulphating" in the body of the plate.

This latter process is liable to be of frequent occurrence in telephone batteries. If, say, a 1,000 ampere-hour battery is installed and only 100 ampere hours used daily and then recharged without periodical complete discharges, this battery becomes in time to all intents and purposes a 100 ampere-hour capacity battery; if discharged beyond its usual 100 amperes the voltage will drop rapidly to 1·75 volts and for it to regain its original capacity it must be charged and discharged quite a number of times *to reform the inner portion of the plates*, which have been idle the whole time and deteriorating.

In fact a battery, like an athlete, requires training and work to prevent it getting stiff or "out of form." J. R. G. evidently infers that by completely discharging a battery is meant discharging *below* specific gravity of 1·18. This is not the case, nor is it stated that allowing a battery to remain discharged is good for it. The reverse is of course the case, and it is well to bear in mind that a fully charged battery will sulphate if left, though more slowly than a discharged one.

With regard to the Cadmium test. This test is used to detect whether the negative or the positive plate is the faulty one in any suspected cell. It is obvious that the voltmeter reading will only give the combined voltage of the two plates whereas by the Cadmium test the voltage of each plate can be determined separately, and it can be judged whether the negative or the positive plate requires to be attended to or renewed.—J. R. M.]

CHESS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

AS a chess player, I was greatly interested to read Mr. Lowe's letter—following a reference to this subject on the part of Mr. Hare in the course of his communication which appeared in the issue of November, 1906—to the effect that an endeavour was to be made to form a chess club amongst the London staff, but as month succeeded month, and nothing further transpired, interest gave way to disappointment, and I have since been forced to the conclusion that the efforts were not attended with success.

What have been the causes of failure? Surely not lack of support on the staff's part, for be it remembered there are several clubs in London attached to banks, insurance companies, etc., whose members are drawn exclusively from their various staffs, and the General Post Office has at least three clubs in connection with the various departments. If then it is found possible in the cases mentioned, and numbers denote anything, surely the establishment of a club strong both in members and play should be a matter of comparative ease.

Like myself, I feel there must be many others who think the Company should no longer be without a representative body in the chess world, and I have not the slightest doubt that if discussion can be invited that end might be achieved.

The movement must have a beginning even though it be a small one, and my suggestion is that an association be formed governed by a small committee, the object of which shall be to further chess interests.

Distance, of course, might hinder matches on a large scale, but is there any reason why there should not be at least one or two great contests yearly, say, London *v.* The Provinces, or North *v.* South? That there is a sufficient number of keen players amongst the staff within easy reach of London, I feel certain is the case, and organisation is all that is necessary to render the event a huge success.

Then again, matches by correspondence between the various provinces for the title of champion should prove of interest, and the recording of the various doings supplemented by a problem and other chess news would not only form a pleasing column in the JOURNAL, but would serve to keep the movement alive and gain adherents.

As a preliminary it would be desirable to ascertain the probable support which would be forthcoming, and this might be accomplished by issuing with the JOURNAL printed slips putting questions somewhat as follows:—

(1) Are you interested in chess?

(2) Would you become a member of, and support the association, if formed?

The information so obtained should then be tabulated, and the result, giving the number of members and players in each district or province published.

Having got so far, the rest might, I think, well be left to the future.

Apologising for encroaching upon your valuable space.

March 16, 1908. ALLAN L. CURLING.

NUMBER, PLEASE

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MUCH has been done in recent years to minimise the amount of talking by operators in our exchanges, greatly to their advantage and tending towards the more efficient working of the Company's system. There is, however, still room for further improvement in this respect, and I venture to suggest that the time has now come when the use of that most unnecessary word "please" might be dispensed with by operators when answering subscribers' calls, the one word, "number," only being used.

This would at one stroke exactly halve the amount of work which the vocal organs of our operators are daily called upon to perform, and the physical relief to them would undoubtedly be very great indeed as a consequence, besides which time would be saved in operating. If properly intonated the one word "number" would sound neither abrupt or discourteous. The word "please" has now become so hackneyed, so far as its connection with operating is concerned, as to have little left of its original significance, and its loss would therefore be felt by none, but, on the contrary, it would be a distinct advantage to all principally concerned.

Bath, March 3, 1908. WALTER C. OWEN.

[*Note.*—"Please" may be hackneyed, but no more so than the other courtesies of life. It is doubly necessary to be courteous by telephone, because invisibility makes abruptness resemble rudeness. Far better drop "number" than "please."—*Ed.* "N. T. J."]

WHAT THE COMPANY IS DOING.

TEN exchanges were opened by the National Telephone Company during last month, making a total of 1,462 now working. They were Billericay and Brightlingsea (Ipswich district), Launceston (Plymouth), Rathmines and Rathfarnham (Dublin), Ferndown (Hants and Dorset), Speldhurst (West Kent), Staple Hill and Flax Bourton (Bristol) and Caister (Norwich); 2,268 stations were added during February bringing the grand total up to 452,166.

Underground Work.—The piping in connection with the underground scheme at ILKESTON has been completed. The NEWARK underground work is finished, and will increase the Company's mileage in the Lincoln centre by approximately 200 miles. It has been decided to increase the existing underground system throughout WALTON-ON-THAMES, and at BRIGHTON an agreement has been entered into with the Corporation to place a portion of the Company's plant underground.

Additional switchboard accommodation is being provided at LEAMINGTON, GUILDFORD, WEYBRIDGE, WALTON-ON-THAMES, CAMBERLEY and FARNHAM. Six kiosks with call offices have been erected at various points in the city of NOTTINGHAM.

A scheme of aerial cable throughout the whole of ALDERSHOT CAMP, a distance of three miles, is nearing completion, the work has excited much interest among the Royal Engineers' Field Telegraph and Wireless Telegraph staff, through whose training ground the route is carried. It may be noted in connection with the Company's open wires that when wireless messages are in transmission there is no difficulty in detecting low insulation on any faulty circuit.

Private branch exchange contracts have been obtained in LONDON from Gorringes, the Royal Palace Hotel and the West End Hotel; from the Industrial Co-operative Society, LEEDS, comprising ten junction lines and 91 stations; from Hurst Bros. & Co., OLDHAM, and from the Stockport Corporation for the new Town Hall; and from Smart & Brown, house furnishers, NOTTINGHAM.

NEWS OF THE STAFF.

Mr. THOMAS MARA, Assistant Engineer, Manchester, retired on pension on Feb. 29, after nearly 29 years' service. Mr. Mara was formerly connected with the Postal Telegraphs, and joined the telephone service in 1879, since when he has been continuously engaged in the Manchester district. Many striking developments in telephone engineering construction have been witnessed by Mr. Mara during his long experience with the Telephone Company. He retires with the best wishes of his colleagues for health and happiness in the years which still remain to him.

Mr. WILLIAM TAYLOR (Local Manager, South Manchester division) has been promoted to the position of District Manager, Barrow-in-Furness. Before leaving he was presented at Altrincham by the South Manchester staff with a silver rose bowl as a token of good will and best wishes for his future welfare, and at Manchester he was presented with a mahogany bureau, suitably inscribed, from the remaining members of the Manchester district staff. Mr. Scott, District Manager, who made both presentations, expressed the sincere congratulations and good wishes of the staff for Mr. Taylor's success and happiness in his new position.

Mr. W. H. FRAZER, of the Engineer-in-Chief's Department, resigned his position with the Company at the end of February, having been appointed Chief Engineer to the Anglo-Portuguese Telephone Company in Lisbon. On leaving, he was presented by the Engineer-in-Chief's staff with a gold pencil-case, knife and cigar-cutter.

Messrs. F. J. GERRARD and W. J. GRAY, of the Engineer-in-Chief's staff, have been elected Associate Members of the Institution of Electrical Engineers.

Mr. W. G. DEARLE, Contract Officer, Tunbridge Wells, has been appointed Wayleave Officer at the Weybridge centre.

Miss L. LARBY, late of Guildford Exchange, has been appointed Chief Operator at the Woking Exchange.

Mr. F. G. SPASHETT has been transferred from Maidenhead to Weybridge as Junior Inspector.

Miss DOROTHY YARNALL has been promoted to be Chief Operator at High Wycombe Exchange, vice Miss Cooper, who has resigned to be married.

Mr. S. J. POWELL, District Office Clerk, has been transferred to Canterbury as Local Office Clerk. Prior to leaving Dover, a small presentation was made to him by the other members of the district office staff.

Mr. J. V. WOOD, Local Office Clerk, Dover, has been promoted to the district office staff.

Miss CLARICE OLDFIELD, Sheffield, was presented with a gold brooch by the operating staff on her resigning the position as Senior Operator, after over six years' service.

Miss D. L. TABOR, Senior Operator, Cambridge, has been promoted to Operator-in-Charge.

Mr. CECIL F. GOULD, who for about four years has been Correspondence Clerk in the East Coast district office, resigned on Feb. 22 to take up a similar appointment in Buenos Aires, South America, with the Buenos Aires & Rosario Railway Company. The District Manager, Mr. O. W. Stevens, on behalf of the Norwich staff, presented him with a Gladstone bag, and expressed the general good wishes of Mr. Gould's fellow workers for his continued success and their appreciation of his aptitude and amiability as a servant of the Company.

Miss KATE REILLY has been appointed Clerk-in-Charge of the principal exchange in Mexico City, Mexico, after six years' service with the National Telephone Company at Manchester.

Miss HELEN RENNIE, Supervisor, Charing Cross Exchange, Glasgow, was, on being transferred to Tron Exchange, presented with a gold brooch by the staff of Charing Cross Exchange.

Miss ELIZABETH MORRISON, Senior Operator, Charing Cross Exchange, was, on leaving to take up her duties as a Supervisor in Hillhead Exchange, presented with a green leather purse bag by the staff of Charing Cross Exchange.

Miss MARGARET SHERRY, Supervisor, Hillhead Exchange, Glasgow, was, on being transferred to Charing Cross Exchange, presented with a gold curb bracelet by the staff of Hillhead Exchange.

Mr. A. E. WARING, Junior Inspector at Royal Exchange, Liverpool, resigned on March 12 to take up a position in the British Insulated & Helsby Cable Company, Prescot. He was presented on leaving with a handsome travelling bag. Mr. David, Exchange Manager, made the presentation on behalf of the operating and electrical staffs in the "Royal" dining room, a large number of members of both staffs being present.

Mr. W. S. DAWSON, Contract Agent, Eastbourne, who has left the Company's service, was on March 14 presented with a silver watch and guard, subscribed for by the Eastbourne staff. The presentation was made by Mr. R. Curling, Local Manager, who voiced the good wishes of the staff for Mr. Dawson's future success.

Miss J. M. MCMILLAN, of the Correspondence Department, Salisbury House, is to be congratulated upon gaining the fourth prize for speed and accuracy in the commercial shorthand and typewriting contest recently held at the Business Exhibition at Olympia. This contest consisted of taking down ten business letters at the rate of 120 words a minute, the whole of the ten to be transcribed within fifteen minutes; also three business letters dictated in an erratic manner, which had to be transcribed within ten minutes. About 30 candidates entered and four prizes were given. It may be mentioned that the fourth prize in this contest last year was won by Mr. J. Wright, the champion typist for England.

Friends in the Company will be pleased to hear of the appointment of Mr. ARTHUR CYRIL JENNINGS as Assistant Engineer of the Telephone Company of Egypt, at Cairo. Mr. Jennings recently returned from South Africa, where he was in charge of extensive telephonic works for the Port Elizabeth Corporation. He entered the Company's service in Canterbury, resigning his position as Local Manager, Margate, on accepting the position in South Africa three years ago.

Mr. F. HUNTER, Rental Clerk, Hull, has been promoted to be Cashier.

Mr. H. BEACHER has been promoted to Head Rental Clerk, Hull.

Mr. J. STUART BEST, late Local Manager, Weybridge centre, Guildford district, has been transferred to Cambridge to take charge of extensive underground cable works.

Miss E. FLEET, Senior Operator, has been promoted to Supervisor, at Nottingham.

Metropolitan Staff Alterations:—

Mr. C. G. RANSLEY, having repeatedly applied owing to the ill-health of himself and his wife, to be transferred to the country, has been appointed to Redhill. It is hoped by his many friends in the service that both he and Mrs. Ransley will derive much benefit from the change.

Mr. BLICK, Local Engineer, Paddington, has been selected to succeed Mr. RANSLEY in the South-West district.

Mr. G. PRATT has been promoted from the Electrician's staff to be Local Engineer, Paddington.

Mr. H. RICHARDS, Assistant Engineer, Gerrard, has been appointed Assistant Engineer, Bromley, vice G. GRIMSHAW resigned.

Mr. F. S. MACMILLAN, Local Engineer, Sydenham, has been appointed Chief Assistant to the Local Engineer, Gerrard.

Mr. W. BYRNE, Assistant Engineer, City, has been appointed Local Engineer, Sydenham.

Mr. H. WHITE, Assistant Engineer, Paddington, has been appointed Engineer on cable work at Gerrard.

Mr. J. SELLARS, Assistant Engineer, Kensington, has been appointed Assistant Engineer, Paddington.

Mr. N. COWELL, Assistant Engineer, City, has been appointed Assistant Engineer, Hammersmith.

London Traffic Department.—*Promotions and Transfers:*

Mr. R. FERGUSON has been appointed Exchange Manager, Westminster, replacing Mr. H. CHURCH transferred to the Metropolitan Electrician's staff.

Miss C. SECKER, Supervisor, Gerrard, has been promoted to be Senior Supervisor at Bank, replacing Miss K. TAYLOR, who is resigning from the service.

Miss E. EVES, Operator, Westminster, has been promoted to be Supervisor at Gerrard. She was presented on leaving with a gold curb ring as a token of regard from the staff.

Miss A. BRADLEY, Operator, Westminster, on being promoted to be Supervisor, Paddington, was presented by her colleagues with a silver mounted umbrella.

Miss L. YATES, Operator, Hop, has been promoted to be Supervisor, Gerrard.

Miss A. PIERCE, Operator, London Wall, on being promoted to be Supervisor, Holborn, was presented on leaving the former exchange with a gold bangle from the staff.

Miss M. COWARD, Operator, Brixton, on being promoted to be Supervisor, Gerrard, was presented by the Brixton staff with a case of scissors.

Miss B. CAMPBELL, Operator, London Wall, on resigning her position was presented with a handbag by her colleagues.

MARRIAGES.

Mr. L. A. SMITH, the Assistant Stores Clerk, Bradford, was married on March 2. He was the recipient of a music cabinet, presented by the Bradford staff.

Miss MAY MILLER, Senior Operator in Crosshill Exchange, Glasgow, left the service on Feb. 27 to be married. The staff celebrated the occasion by having a social evening, and presented her with a pair of handsome bronze ornaments with their best wishes for her future happiness.

Miss F. JONES, operator at Boxmoor, who left the Company's service on Feb. 22 to be married, was presented with a standard lamp by the staff in the Luton centre.

Mr. J. R. C. GAUNT, Stores Ledger Clerk, Nottingham Factory, was the recipient of a handsome kit bag, together with a set of hall brushes, a silver fruit knife, and a pair of gold cuff links, on the occasion of his marriage. Mr. C. E. Fenton made the presentation on behalf of the Factory and Engineer's-in-Chief's staffs.

Miss L. WATERS, Supervisor, Paddington Exchange, on resigning to be married was presented with a gold bangle by the staff.

Miss K. HOLLOWAY, Supervisor, Paddington, also leaving to be married was presented with a dinner service by the Paddington staff, and glass by Hampstead staff.

Miss B. BENNETT, Operator, Holborn, on leaving to be married, was presented with a tea service by the whole of the operating staff.

Miss E. PINHORN, Nottingham resigned her position of Lady Canvasser (after five years' service) in order to be married. Mr. C. H. Sibley, the District Manager, presented her with a pair of pictures on behalf of the staff.

Miss F. LOWLESS, Operator, Cleethorpes, resigned to be married on Feb. 27.

Mr. S. W. AYSCOUGH, Chief Inspector, Grimsby, was presented by the staff with a dinner service on the occasion of his marriage, March 11.

OBITUARY.

It is with great regret that we have to record the death of Mr. Ernest A. Harrop (Senior Contract Officer, Swansea), which took place after a fortnight's illness on Feb. 24. Deceased, who joined the Company's service in 1899, was very popular amongst the staff and will be greatly missed. He took a keen interest in the Telephone Society, being secretary during the first session in 1906-7, and at the meeting held on March 16 a vote of condolence with his widow was passed. The funeral, which took place on Feb. 29, was attended by a large number of the Swansea staff.

ERNEST A. HARROP.

We also regret to record the death of Mr. W. D. JOHNSON, Contract Department Representative at Worthing, which took place at the Sussex County Hospital on Feb. 20, after a painful illness. The funeral took place on Monday, Feb. 24, at the Brighton Parochial Cemetery, the Company being represented by Mr. C. F. Moorhouse, Contract Manager of the Sussex district, and by several members of the Contract Department staff. Mr. Johnson was well known amongst the Glasgow contract staff, and had made many staunch friends during his sojourn in the south. Men of his calibre the Company can ill afford to lose. His *confrères* sent a beautiful wreath as a token of regret.

Another death we have to announce is that of Mr. EDWARD ATKINSON, who died of heart failure on March 18, at the age of 34. He entered the Company's service on May 29, 1893, as General Clerk, and two years later was appointed Cashier, which post he filled until February of this year, when he was transferred to the district office to assist the Chief Clerk. In all movements of the staff, social, educational or otherwise, Mr. Atkinson was always an active force, and no committee was considered complete without him. His loss is to be greatly deplored both by the Company and the Hull staff generally.

LOCAL TELEPHONE SOCIETIES.

London.—A meeting was held on Feb. 26, 98 members being present. Mr. T. Fletcher was in the chair. Mr. W. Benham read a paper entitled "Exchange Organisation." A number of diagrams had been prepared showing the result of improved organisation and observation. He showed that methods adopted at London Wall, such as subdivision of team work, the employment of combined distribution and monitors' chart cards, and the new method of checking repeated faults by the exchange testing operator tended to improve the service with economy. This definite system of improved organisation had resulted in increasing the operator's standard day load to a very large extent, combined with an improved speed of answering and clearing. The following members took part in the discussion:—Messrs. J. Collins, H. Deane, P. Mantle, L. Harvey Lowe and J. Edmonds.

A meeting was held on March 9, with about 85 members in attendance, Mr. T. Fletcher occupying the chair. Mr. A. Watts was called upon to read his most interesting paper entitled "Block Wiring," and was assisted by Mr. Watkins, who explained a large number of lantern slides showing types of apparatus used for block wiring. He spoke of the American development during the past few years. He dealt with the comparison of cost as between ordinary overhead and block wiring, followed by the fact that a telephone engineer without a development study was like a railway engineer who proposes to give information about his curves and gradients when he has only made a rough survey of his work. The following members took part in a discussion:—Messrs. T. Fletcher (for Mr. Shar), J. Stirling, C. Elliott, L. Harvey Lowe, J. L. Brown, G. F. Greenham, E. Gray and J. Junt.

Southern (London).—The February meeting was held on Feb. 20, a paper being read by Mr. J. McLeish entitled "Improvements and Alterations in Battersea Circuits." The Kellogg system was well explained with the aid of lantern slides. Many of the members took part in the discussion which arose.

The March meeting was held on March 17, a paper being read by Mr. T. M. Inman on "Details of Apparatus." The lecture, which was illustrated by lantern slides, including some kindly lent by the Engineer-in-Chief, proved very interesting, and a lively discussion took place.

A lending library has now been opened consisting of 45 volumes, and will undoubtedly assist greatly in the useful work which is being done by the society.

Western (Metropolitan).—The ordinary monthly meeting of this society was held on March 5, the president (Mr. G. F. Greenham) presiding. A paper entitled "Faults and Inspections" was read by Mr. E. Randell, who described the various duties of an instrument inspector and the difficulties met with by him when carrying out his work. A discussion on the paper followed its reading, and the hearty manner in which the subsequent vote of thanks to Mr. Randell was given testified the members' approbation of a most interesting and instructive lecture.

Bristol.—The sixth and concluding sessional meeting was held on March 5 when a good number of the members were present to hear a lecture by Mr. B. S. Cohen, Engineeer-in-Chief's Department, London, entitled "Loading of Telephone Cables and Lines." Mr. Cohen not only interested the majority present but added to their knowledge by his description of the coils used to improve speech transmission in connection with the cable work of the Company. The method of making the coils was described, also the manner of insertion in manholes and the ultimate results obtained. Mr. Cohen at the close also answered several questions. The chairman was Mr. Dalzell.

Bristol Operators.—The last sessional meeting for 1807-8 was held on March 17, when an interesting paper was given by Miss F. Nicholls (Clerk-in-Charge) on "The Relations of Juniors to Seniors, Seniors to Supervisors, etc." The lecturer ably dealt with the subject and impressed upon all her hearers the necessity for closely watching the trifles. "Trifles make perfection but perfection is no trifle," being one of many maxims brought forward. Miss Nicholls also gave some very interesting and amusing experiences of some of the old pattern switchboards which were illustrated by lantern views. At the close of the lecture Mr. A. Perkins (District Manager) very kindly exhibited a series of lantern views which were much appreciated by all present. Mr. R. A. Dalzell (Provincial Superintendent) presided over an attendance of 85 per cent. of the available staff.

Coventry.—A meeting was held on March 16, Mr. J. N. Lowe presiding over an attendance of 21 members and two friends. Mr. W. Dickinson (Local Manager at Northampton) gave a very exhaustive paper dealing with the subject of "Local Office Routine," showing its relationship to the district office. A discussion of some length followed, bringing out certain points where both offices could work together and so save a certain amount of duplication. This paper was followed by one prepared by Mr. C. B. Robinson (Chief Inspector at Northampton) upon "Faults," giving graphic details of the nature of faults, both from those reported by subscribers and those found out when visiting. This also was followed by a discussion showing the desirability of having the office dealing with "faults" at the local office rather than at the district office.

Brighton.—On Feb. 26 Mr. A. W. Dalton, Test Clerk, Brighton, gave a lecture on "Instrument Ftting." Some useful hints were given on the selection of position and other necessary details; and also on the most expeditious way of clearing faults. Mr. F. W. Roberts, Local Manager, presided.

On March 18 Mr. C. J. Phillips, Provincial Superintendent, was the lecturer, Mr F. W. Taylor, District Manager, presiding. The lecture was entitled "Telephone Reminiscences" and proved to be of a very interesting character, being well illustrated with lantern slides. There was an attendance of nearly 70, including Mr. A. Watts of Manchester, and Messrs. D. J. Barnes and Cowie of the Brighton Post Office telephone service. Members of the telephone society attended from all parts of the county.

Bradford.—The monthly meeting was held on Feb. 19. The District Manager, Mr. H. B. Sutcliffe took the chair and briefly introduced the lecturer, Mr. Wicker, the Huddersfield Local Manager, who gave a most interesting and instructive paper entitled "Some Natural Phenomena in their Relation to Telephone Practice." The address was illustrated by the aid of a lantern, Mr. Wicker having secured a number of slides from the Royal Meteographical Society which had not previously been exhibited out of London, and these added greatly to the interest of the subject.

East Kent.—This society's fourth meeting was held on March 10, when three short papers were given as follows:—"Wayleaving," Mr. A. W. Bridle (Canterbury); "The Stores Clerk as an Economist," Mr. E. W. Wilson (Dover); and "General Working of Party Lines," Mr. F. E. Faithful (Folkestone). Some interesting points were raised, especially with regard to the last-mentioned paper, and a lively discussion followed. The meeting may be voted one of the most successful of the session, 59 per cent. of the members and two visitors being present.

Bolton.—The fourth meeting was held on Feb. 20, Mr. A. C. Haley occupying the chair. Two papers were read. The first one was by Mr. J. T. Hart, entitled "Telephone Receivers." He explained the theory, and described the construction of receivers from the Reis instrument to the present form, illustrating his remarks by some well drawn blackboard diagrams. The second paper on "Telephone Transmitters" was read by Mr. W. Higson, and was given under two headings, viz., "Early Transmitters" and "Modern Transmitters." The gradual evolution of transmitters was explained, their principles, construction and theory. A feature of this lecture was that the necessary sketches were drawn on foolscap, and a copy given to each member present. The papers proved very interesting, and were well discussed by the 40 members present.

Cardiff.—The sixth meeting was held on March 5, Mr. B. Waite presiding. A paper was read by Mr. James (Local Manager) entitled "Practical Side of Underground Construction," and there was a good muster. The subject was dealt with from its initial stage and from a practical point of view as a result of the usual development studies. The details of the paper embodied preparation of estimates, practical trenching, manholes, pilot holes, etc., with details of cost, also the drawing in of cables, jointing and testing. The various branches of the work were illustrated with some very excellent diagrams. The lecturer made special reference to a small scheme which he recently carried through at Cardiff, in which case the whole of the work was done by the Company, resulting in a considerable saving, particularly in the trenching and refilling. Mr. James laid special stress on the necessity of the greatest care being exercised in connection with jointing and plumbing. In the scheme above referred to the result of the insulation tests came out excellently, which the lecturer attributed to very special care being taken in the jointing and the adoption of sheet-iron lining in the bottom and at the sides of the jointing chambers, which prevented moisture rising from the wet ground and getting into the joints. An interesting discussion followed.

Cardiff Operators.—The sixth meeting was held on March 10, when 87 per cent. of the operators attended; also the four vice-presidents, Mr. Waite, the District Manager, being in the chair. Miss Compton, Supervisor, Cardiff, read a most interesting paper on "Team Work: What It Is and What It Does." The chief points of the paper were the necessity for co-operation in all teams and competition between teams. Miss Compton pointed out the added interest to an operator who really endeavoured to faithfully carry out team working. However expert an operator might be in herself, unless she co-operated fully with the rest of the team she was not doing good work. Miss Compton also dealt with the question of the operating at sub-exchanges, showing how slow answering on junctions affected the team working. A discussion followed, in which many of the operators took part.

Sheffield.—A meeting was held on March 13, when a paper was given by Mr. F. G. C. Baldwin, A.M.I.E.E. (District Engineer, Birmingham), on "Telephone Development in its Application to Underground Work." In this paper an interesting and lucid description of the methods of forecasting "development" by means of past records and the probable growth of the district under consideration was given. The method of determining the correct position of an exchange was shown. The paper showed the necessity of economy combined with efficiency. The lantern slides of curves, statistics, etc., were a valuable addition to the paper.

Swansea.—The sixth and final sessional meeting took place on March 16, Mr. W. E. Gauntlett, District Manager, occupying the chair; 65 per cent. of the members were present. The evening had been set apart for competitive papers, for which prizes were offered, and the following is the list of the subjects dealt with:—A. L. Margetts, "The Company and the Public"; F. H. Pearce, "Stores Records"; H. Freshwater, "Instrument Faults, etc."; W. Howells, "Our Society"; A. Johnson, "Ten Party Lines," each being read by the writer, and separately discussed. As the number of competitors was small and the quality of the papers extremely good, it was decided by the committee to grant an award in each case. The sum of money set aside for prizes out of the Head Office grant was therefore divided between the five writers. Awards were also granted to those members who attended the meetings most regularly during the session.

Swansea Operators.—The last sessional meeting was held March 11, when competitive papers by members were read. There was an excellent attendance of 93 per cent. of the total members. The papers, numbering nine, proved most interesting, the subjects including "The Training of an Operator," "Call Wire Working," "Team Work," "The Aims of an Operator," and "Suggestions for Improving the Service," each being dealt with in a comprehensive manner. After an animated discussion, the prizes were presented by the chairman, Mr. W. E. Gauntlett (District Manager) on behalf of the society to Miss F. Pritchard (Docks Exchange), Miss E. J. Davies and Miss L. Rees (Central Exchange).

Nottingham.—On Feb. 21 the seventh meeting of the Nottingham District Telephone Society was held, and Mr. H. Laws Webb gave his lecture on "Publicity and Promotion." It was a most enjoyable paper well interspersed with lantern slides. The original methods of the American telephone companies in advertising created much interest and amusement. Considerable discussion subsequently took place. The visitors included Mr. A. Watts, of the Engineer-in-Chief's Department, and a number of visitors from Derby and from Nottingham Factory and Engineer-in-Chief's staff at the Factory.

Chester.—The sixth meeting was held on Feb. 19, Mr. Bates, District Manager, presiding. Mr. W. H. Meaking, Chief Clerk, gave a paper on "District Office Routine." The attendance was the highest for the session, 21 members and nine visitors being present. The lecturer explained the methods of dealing with the subscriber's agreement after the Contract Department had finished with it. He drew on the blackboard the rulings of the different books, and explained briefly the system of the Company's bookkeeping. Capital expenditure and revenue expenditure was explained for the benefit of the junior members of the staff.

Greenock.—The seventh meeting was held on Feb. 27. The president, Mr. A. Ramsay Lamb, occupied the chair. Mr. P. Smith, jun., Contract Officer, delivered a most interesting paper on "The Chemical Composition of an Instrument." After detailing the various parts of which an instrument is composed, the lecturer proceeded to describe the processes of manufacture of the various metals and non-metals, pointing out their various properties. Quite a number of interesting and effective experiments were shown to demonstrate the subjects dealt with, all of which were successfully performed. The chemical action of the battery was fully dealt with and simply explained. Considering the technical nature of the subject, the simplicity of the language allowed each member to follow and understand every item. A number of important questions, principally on chemistry, were asked, and these were satisfactorily answered by the lecturer.

The eighth meeting was held on March 12. Mr. A. Ramsay Lamb, president, occupying the chair. Mr. H. Laws Webb delivered an instructive paper entitled "Publicity and Promotion." The lecturer dealt with the growth of the telephone business in various parts of the world and showed the future possibilities of the business in this country. Some very valuable information was given as to canvassing, particularly for measured rate lines. A discussion followed. The lecture throughout was illustrated by a series of lantern slides.

The sixth meeting was held on Feb. 6, when Miss A. Masterton, Chief Operator, delivered a paper entitled "Operating Experiences" The lecturer described the various changes which had taken place in Greenock. The old switchboard was one of 150 lines, double cords with slipper plugs and receiver and transmitter attached to board. New premises were taken, and a new board of the Scribner pattern was fitted. This board was superseded in 1896 by the existing flat multiple switchboard with call wire working. A lantern slide showing the board was put on the screen and the operating methods fully explained. Mention was also made of the central battery system which is expected to be introduced in Greenock in the near future.

Glasgow.—The seventh meeting was held on Feb. 26, when Mr. Watts delivered an instructive paper on "Development Studies and Why they are Necessary." Several members took part in the discussion which followed the reading of the paper.

The eighth meeting was held on March 11, when Mr. Herbert Laws Webb delivered an interesting and instructive paper on "Publicity and Promotion." The points dealt with included "The Education of the Public," "The Proper Basis of Charge," and "The Different Methods of Advertising." Mr. Webb's lecture was much appreciated by all present.

Glasgow Operators.—On Feb. 24 two papers were read by lady members The first paper, entitled "The Advantages of the Telephone Service," was read by Miss J. Aitken, of Douglas Exchange, and the second written by Miss L. Mortimer, Clerk-in-Charge, Douglas Exchange, and read by the president, Mr. T. Rodger, dealt particularly with the question of ticket recording of calls. Thereafter the fifth meeting of the club was opened when a programme of songs, readings and games was indulged in, and a very pleasant evening was spent.

Cork.—On Feb. 27 a paper was read by the District Manager, Mr. A. M. Kidd, entitled "Faults: Their Prevention or Remedy." The essayist dealt at length on the various classes of faults, both electrical and engineering, and explained as briefly as possible how they should be prevented or removed. An interesting discussion followed.

Oldham.—A very interesting lecture was delivered in connection with this society on Feb. 26 by Mr. J. Cleary, Assistant Engineer, Stockport. Mr. Cleary took the subject of "Planning Outside Engineering," and showed the importance of a scientific and thorough calculation of the present conditions of a place in regard to population, etc., so as to arrive at its ultimate possibilities. He explained the utility of skeleton plans showing subscribers' places plotted out, and illustrated this part of his subject by a plan thus made of Macclesfield. The lecture was highly interesting and the subject was illustrated by numerous diagrams, some of which showed the American system of block wiring. The District Manager occupied the chair, and there was an attendance of about 75 per cent of the membership of the society.

Walsall.—A meeting was held at the local office on Feb. 24, when a well thought out paper was read by Mr. H. T. Warrend on "Accumulators: Their Theory and Practice," a good attendance being present including members from Wolverhampton. An interesting item during the evening was a presentation to Mr. R. S. Grosvenor, Walsall Local Manager, and Miss E. Preston, of Walsall, by the Walsall and district staffs, on the occasion of their marriage. The present took the form of a handsome marble timepiece, suitably inscribed. The chair was taken by Mr. Archer W. Smith, District Manager, who made the presentation. Both Mr. Grosvenor and Miss Preston received hearty congratulations and good wishes from the whole of the staff.

Wolverhampton.—The usual monthly meeting was held at the district offices on Feb. 28, when two interesting and instructive papers were read by Mr. F. Lucas, Contract Manager, and Mr. R. W. Lloyd, of the Inspection staff, on "Commercial Telephony" and "Switchboards and Their Connections," the papers being much appreciated by the gathering present. A number of the operating staff joined in a lively discussion on the latter paper. The chair was taken by the Chief Clerk, Mr. W. S. Kay.

Leeds.—On Feb. 19 a paper was read by Mr. T. A. Crowther, district office, Leeds, entitled "The Commercial Side of the Company's Working." The meeting was well attended, and the members were very interested in the paper, which was given in an able and lucid manner. The speaker dealt entirely with the commercial aspect of the Company's working, and gave an idea of the office routine. After the paper was read, an active discussion took place. The chair was taken by Mr. A. Martin, Assistant Provincial Superintendent

On Feb. 26 Mr. H. Laws Webb delivered a most interesting lecture entitled "Publicity and Promotion." The lecture was illustrated by means of some very effective and instructive lantern slides, and the lecturer held the attention of his hearers throughout. Mr. W. V. Morten, the president, occupied the chair.

On March 4 a paper was given by Mr. Napier, of the Head Office staff, on "Traffic." There was a large attendance, which included a number of the operating staff. The lecturer showed a series of lantern slides, showing different types of switchboards. Several diagrams and curves, illustrating loads and developments were also shown, and their value in forecasting future conditions was dwelt upon. Questions and discussions were invited and the former were replied to by Mr. Napier. The District Manager was in the chair.

Nottingham Factory.—At a meeting held on Feb. 24, 140 being present, Mr. A. J. Bone gave a paper on "Electro Plating," which was followed very attentively. By means of a small experimental plant, the various operations involved were demonstrated. First of all, the preparations before putitng into the vat were explained; the scourings and the actions of the various bobs and mops being shown. The difficulties the plater has to contend with were mentioned, especially where articles have been previously plated. How the articles are finished off after the plating process was shown. Discussion followed, and the

chairman, Mr. C. E. Fenton, in concluding, stated that during twelve months, the Plating Department dealt with 2,100,000 instrument parts, as well as 60,000 bell domes, 30,000 cradles and over 2,000,000 screws.

The sixth meeting was held on March 16, Mr. C. E. Fenton being in the chair, and 96 present. Mr. W. Fox gave a paper on "The Use and Abuse of Tool Steel," in which he dealt with the properties of the various steels used in making tools, describing the correct methods to be employed in annealing, forging, hardening and tempering. Mr. T. H. Wallace followed with his paper on "Timber and Some of its Uses," illustrated by excellent drawings. The characteristics of growth and structure of the principal woods of commerce were noticed. The points to be observed in felling, seasoning and creosoting were mentioned; diseases and defects pointed out, and the commercial terms and sizes used in the trade described. Discussion followed each paper, in which questions were asked and suitably replied to.

Liverpool and Birkenhead.—*The fifth meeting was held on* Feb. 27, 40 members being present. The president was in the chair. Mr. G. J. Drysdale read a paper dealing with the "Recent Developments in Wireless Telephony." The lecturer gave a brief *resumé* of what had already been accomplished by the agency of electro-magnetic and electro-static induction. He then dealt with the discovery of the speaking arc by Simon, and with the improvements of Duddell and Ruhmer. The experiments of Ruhmer on the Wannsee, near Berlin, were illustrated and explained. After treating of Hertzian waves, the lecturer touched on the work of Marjorana, Fessenden, and Poulsen, and concluded with a discussion of the limitations of wireless telephony and its possible future developments.

On March 2 Mr. Laws Webb read a paper entitled "Publicity and Promotion," on which an interesting discussion resulted, in which Mr. Hidden, Mr. Roberts, the Contract Managers of Liverpool and Warrington, the Chief Clerk, and Messrs. Batha, Peacock and Currie took part; 150 members were present, including 30 ladies and six visitors.

Newcastle.—The fourth meeting was held on Feb. 20, with Mr. Jackson (Local Manager) in the chair. The first paper was given by Mr. Jones, Foreman (late of Liverpool), on "Liverpool Overhead Construction." This was illustrated by lantern slides, and the chief points brought out were the considerable ingenuity exercised and the engineering skill displayed in wayleaving and constructing these erections in almost impossible positions. Mr. Drummond, the District Manager, added some remarks with reference to staying of roof standards as carried out in Liverpool. The second paper was given by Mr. E. T. Payne, Chief Clerk, on "Card Records," and was illustrated by useful diagrams. His interesting paper evoked considerable discussion, in which Messrs. Gwyther, Preston, Drummond, Jackson and others took part. There was a very good attendance.

Birmingham.—On March 3 two papers were given by members of the staff, the first of which was by Mr. H. W. Powell (of the Engineering Department), dealing with "Engineering Records." Suitable lantern slides were used to illustrate the various points. The criticisms which were offered by various members of the staff showed that great interest had been taken in the paper. The second paper, by Mr. A. H. Tilt, on the "Development of the Junction," was of a most instructive character, and the various details and complications in switchboard work in connection with this particular branch of the service was clearly explained, descriptive lantern slides being shown. Mr. E. Williamson (District Manager) presided.

Birmingham Operators.—The last meeting of the session was held on March 12, the chair being taken by Miss E. Adams, who made a very happy speech on opening the meeting. The lecture was given by Mr. S. O. Allen, Exchange Manager, on "Subscribers' Impressions of the Telephone Operator and How they are Formed." During the course of the lecture he dealt with various branches of the service, and showed by means of charts taken from various observations how subscribers formed their impressions from the results of the work. After the lecture, books as souvenirs for reading papers at the previous meeting were presented by the District Manager to Miss E. Williams, Miss M. Hadley, Miss F. Lambert and Miss E. Fisher. This being the last meeting of the session, the president of the society, Mr. C. W. Piggott, made a few remarks on the progress made by the society. A social gathering has been arranged in April to wind up the session, of which full particulars will be announced.

Hull.—On Feb. 17 a paper on "Magnetic and Electric Properties of Apparatus" was given by Mr. Akester, the chair being occupied by Mr. Pinnock. Mr. Akester avoided using technical terms as far as possible and made the subject interesting to all members by dealing with elementary subjects in language understood by all. The use of different apparatus was carefully explained, several charts and diagrams being brought into use and blackboard illustrations shown of the action of currents when passed through different circuits. The discussion was as usual very interesting, the lecturer at the close making clear any points that did not appear quite plain to the audience. A further paper was promised by Mr. Akester on the more complicated circuits in use on the Company's system.

Mr. Tattersall gave his paper on "Underground Work, Past and Present" to a keenly interested audience on March 9, the District Manager, Mr. C. C. Worte, taking the chair. The lecture was illustrated by means of lantern slides, showing work to be done and materials required for the proper laying of underground cables. A special point was made in showing the different spare areas required by present day cables compared with that which would be necessary had we to-day the old style cable in use. On the table were specimens of cable from the earliest to the present day style of manufacture, the various types proving of great interest to all present.

Dublin.—On March 2 a paper was read by Mr. G. Sutcliffe, Sub-Engineer, on "Slide Rule and Curve Plotting." This most interesting subject was treated in a very able and instructive manner, and was illustrated by an enlarged and specially prepared slide rule and curves. From the latter Mr. Sutcliffe explained how the Company forecasted future developments, and dwelt on the value of curves in connection with the Company's business, both from an engineering and administrative point of view. A considerable amount of mathematical formula was introduced, and altogether the paper was one of the most successful of the session. The Superintendent for Ireland was in the chair.

A further meeting was held on March 9, when a paper on "Operating" was read by Miss Boylan, Monitor. The subject was briefly treated, but at the same time contained much matter for discussion, to which the greater part of the evening was devoted. Miss Boylan, in the course of her remarks, pleaded for efficient maintenance of switchboards and a better understanding by the subscribers of the rules governing the use of the telephone. The usual operating troubles surrounding automatic boxes were discussed at length. In bringing the paper to a close, Miss Boylan stated, from her observation, that generally speaking the measured rate subscriber was the least troublesome, and best contented.

Isle of Man.—A meeting was held on Feb. 21 fifteen being present. A paper was read by J. W. Thompson, Assistant Lineman, on "Testing Circuits." The lecturer explained the connections of the various testing sets, showing how to test, and how to join up by pegs and cords provided at the various boxes the two good sides of two brokendown circuits, so as to get one temporarily working circuit during breakdowns; also how to join up with earth in case only one through wire could be made up out of a number of brokendown circuits. A keen discussion followed.

On March 13 the paper on "Location of Faults," which was postponed from the previous Friday, was read. The District Manager opened the proceedings with a very beautiful exhibition of vacuum tubes, illuminated by a large induction coil. The paper dealt exhaustively with the various means of locating faults both in instruments and on lines, and showed that the writer had a thorough grasp of his work. Thirteen members were present, and an interesting discussion followed.

Manchester.—A paper was read by Mr. H. Laws Webb on Feb. 28 on "Publicity and Promotion." Mr. Laws Webb is always appreciated by the Manchester Telephone Society, and Friday, Feb. 28, was no exception. The paper dealt with the need of educating the public to the use of the telephone and the cultivation of friendly public opinion. A number of slides of advertising matter, English and American, were shown. The cultivation of friendly relations with the Press and the general co-operation of the staff were also emphasised points.

On Feb. 21 Mr. W. M. France read a paper on "Common Battery Working." Mr. France began by showing the simple diagram of a common battery circuit, and gradually worked up to the present system as built up in various exchanges. A good number of slides illustrated the paper, and especially interesting was a series showing the procedure of receiving and answering an exchange call. Mr. France also showed a model common battery circuit from subscriber to subscriber, which was of great interest and was greatly appreciated.

STAFF GATHERINGS AND SPORTS.

London.—*Eastern Division.*—The annual dinner took place at the Eastern Hotel, Limehouse, on Feb. 28, when about 50 members sat down. The smoking concert which followed proved a great attraction, fully 150 members and friends being present. Mr. C. E. Tattersall (Divisional Engineer) presided, the vice-chair being occupied by Mr. P. G. Head (Exchange Manager), and amongst those present were Mr. C. B. Clay (Metropolitan Superintendent) and Messrs. Stirling, Elliott, Fletcher, H. Davis and Greenham. The loyal toasts having been duly honoured, the Chairman gave "The Visitors," which was responded to by Mr. Clay and Mr. Fletcher, the former expressing his pleasure at being present, and stating that he considered such gatherings to be beneficial both to the Company and the staff. Mr. R. P. Lowe (Divisional Contract Agent) proposed "The Chairman and Vice-Chairman," which was duly responded to by Mr. Head. A capital programme of music was arranged by Mr. W. Dance and given under his personal superintendence.

National Telephone Staff Benevolent Society (Entertainments Committee).—The concluding entertainment of a highly successful series on behalf of this deserving charity took the form of a whist drive at Spiers & Pond's Restaurant, Moorgate Street Station, on Monday, March 16. Two hundred and sixty two members of the staff and their friends were present, and a very enjoyable evening was passed. The prizes (presented by Messrs. J. Stirling, R. Bryson, W. E. Pegden, J. Guest, H. Deane, J. B. Ryall, H. Phillips and the Assistant Electricians) were distributed by Mr. Stirling, who alluded to the good work, both from the social and benevolent point of view, accomplished by these gatherings. The experiment having been so successful, it is intended to repeat it next season.

Hammersmith Soiree.—The opening of Hammersmith Central Battery Exchange on Dec. 7 last was celebrated on Friday, Feb. 28, by a highly successful soiree held in the Fulham Town Hall. The gathering numbered upwards of 250. Among those present were Messrs. C. B. Clay, L. Harvey Lowe, J. F. Edmonds and W. J. Gilmour. The arrangements had been admirably arranged by Miss F. M. Neller, the Clerk-in-Charge of the exchange, and a most delightful evening was spent. Amongst those who contributed to an interesting and varied programme were Miss Edith Robinson, Miss V. Tallin, Mr. T. Beck, Mr. Bret Hayden, Mr. Herbert M. Montefere, Mr. E. Peacock, Mr. Gerald Lindley, Mr. W. B. Haynes, Mr. Percival Thorne and Mr. Arthur Grayson. Dancing proved a further attraction, Mr. Heinrich Huck's band rendering excellent music. The Leap Year Waltz afforded much amusement to all, with the exception of "The Gibson Girl" (Mr. Grayson), who, owing to his dress, was obliged to take the ladies' side and dance with his own sex. Messrs. H. E. Parker and P. Courtney were energetic M.C.'s, while Messrs. C. W. Naughtin, A. T. Waller, C. F. Arrowsmith and C. Knapman did good service as stewards. The programmes were sold in aid of the benevolent fund. At the close of the evening Mr. C. B. Clay made a most encouraging speech, in which he referred to the successful working of the Hammersmith Exchange, and concluded by tendering his thanks to Miss Neller and her staff for the highly enjoyable evening which this occasion had afforded him and many others.

Western District Telephone Society.—In connection with this society a smoking

concert was held at the Swiss Hotel, Old Compton Street, on March 13. Under the able chairmanship of Mr. G. F. Greenham over 100 members and their friends were given an excellent entertainment. During the course of the evening the toasts of "The Western District Telephone Society," "The President" and "The Entertainment Committee, Artistes and Visitors" were proposed by Messrs. F. O. Steed, J. H. Stewart and F. M. Hall respectively and were drunk with enthusiasm, and the subsequent responses of Messrs. A. Wright, G. F. Greenham and E. Randell also met with hearty approval. The proceedings terminated at 11.30 p.m., when all present voted the evening a most enjoyable one and its object a great success.

Avenue Cricket Club.—The secretary desires to call the attention of the staff to the decision of the officers of the club that the membership should be extended to the whole of the Metropolitan staff and not as formerly limited to the Avenue Exchange staff. The subscription is 2*s.* 6*d.* per annum with an entrance fee for new membership of 1*s.* Home ground for coming season, Southwark Park. The club is under the patronage of Mr. Greenham, Mr. Ryall and others. Further information cordially given by the hon. secretary, H. J. Henley, 23, Surrey Grove, Old Kend Road, S.E.

Dover.—The second annual social gathering of the East Kent staff took place at the Drill Hall, Dover, on March 13. The evening's entertainment was opened at eight o'clock by a short address of welcome from the District Manager (Mr. C. F. Ashby). About 120 were present, including contingents from Canterbury, Folkstone, Ramsgate and Margate, as well as a large majority of the Dover staff. An excellent programme had been arranged by the hard-working committee. The dancing was interspersed with songs and games, and for non-dancers a whist drive was organised and heartily entered into. By no means the least important feature of the evening was a sketch entitled "Turn Him Out," produced in first-rate style by several members of the Dover district office and local office staffs. An enjoyable supper was served at 11 p.m. Mr. J. Wood made an excellent M.C., whilst a large share of the credit for the success of the evening is due to the social secretary (Mr. F. Duerth).

Liverpool.—The annual dinner of the staff was held on Feb. 22, at the Bear's Paw Restaurant, when a representative company sat down to an excellent repast. After the dinner a concert was given by friends and members of the staff, a very pleasant evening's enjoyment being obtained.

A whist drive in connection with the Central Exchange, was held at the King's Cafe on Feb. 29. There were 70 tables occupied, and eight prizes competed for. The committee, consisting of Misses Westcott and Evans, and Messrs. Hewitt and Thompson, carried out their duties in a very effective manner, and Mr. Ben Adams made an efficient M.C.

A successful Cinderella was held in connection with the Central Exchange at the Gainsborough Café, on Friday, March 13. The music provided was excellent, all the newest and favourite dances being played, including a Leap Year Waltz.

Birmingham.—The annual ball of the Birmingham and district staff took place on Feb. 22 at the Grand Hotel, when about 160 members and friends were present. The following ladies and gentlemen acted as stewards:—The Misses Crowther, Fisher, Hadley, Hart, Lambert and Pope, and Messrs. Allen, Cornfoot, Maclure, Price and Powell. Altogether it was the most successful and enjoyable dance held for many years and the committee are to be warmly congratulated on the result. Mr. R. U. Tucker acted admirably as M.C. Messrs. Rhodes and Savage were hon. secretaries.

Dundee.—Members of the staff met in the district office, Panmure Street, on March 6 and presented the Local Manager, Mr. Alex. Mackenzie, with a handsome marble timepiece, as a token of their appreciation on the completion of 25 years' continuous service in the Dundee district. The presentation was made by Mr. Brown, the District Manager, who referred at length to Mr. Mackenzie's long connection with the Company and the uniformly cordial relations which have prevailed between him and the rest of the staff. Mr. Mackenzie suitably acknowledged the gift and after remarks from the heads of the various departments and a vote of thanks to the chairman, the proceedings were brought to a close by the company singing "For he's a jolly good fellow."

Middlesbrough.—The fourth annual dinner of the district staff was held in the Wellington Hotel, Feb. 21, the District Manager (Mr. Swithinbank) presiding, the vice-chair being occupied by the Chief Clerk (Mr. Hann). A large and representative gathering assembled, and, after the usual toasts had been duly honoured, an excellent programme was provided by Messrs. Cockrill, Hinchley, Wade, Stones and Fuller, accompanied on the piano by Mr. Hodson.

Glasgow.—A most enjoyable evening was spent in connection with the Tron area of this district (*i.e.*, Tron, Gorbals and outlying exchanges) on Feb. 22 in St. Mungo's Halls, South Side. It took the form of an "At Home," dancing, singing and games being indulged in from 5 p.m. till 11 p.m. About 130 were present, including Mr. Rodger, Traffic Superintendent, and Mrs. Reid, Chief Operator for outlying exchanges.

Luton.—A social evening was held in the Franklin Restaurant on Feb. 22. The programme included dancing, with the usual round games. Miss Whitmore, Miss Goodchild, and Messrs. Maber, Davies, Crawley, Land, Moody, Raines and Cain contributed to the musical part of the programme. Mr. H. J. Raines ably carried out the duties of M.C. A good number of the staff and friends, including the District Manager and Mrs. Wilson, were present, and all appeared to have spent a very enjoyable time.

Oldham.—A very successful whist drive and dance took place at the Reform Club on Saturday, March 7. There was an attendance of about 120, made up largely of members of the staff at Oldham and Ashton-under-Lyne. Twenty-eight tables were under requisition for whist, and Mr. A. Pugh, District Manager, presented the prizes to the successful ones. The remainder of the evening was taken up in a programme of dances and songs. All the arrangements were in the hands of the staff of the Operating Department, and were very ably carried out.

Kilmarnock.—A smoking concert organised in connection with the Ayrshire staff was held in the Royal Hotel on Feb. 21 under the chairmanship of the District Manager, Mr. G. A. McDonald, when a lengthened and varied programme was carried through.

Norwich.—On the evening of March 4 a very successful whist drive was held at the Criterion Restaurant, Norwich. Twenty-nine tables were filled and fourteen prizes competed for: the first prize, ladies, was taken by Miss Eayrs, and first prize, gentlemen, by Mr. Gibbs. Mr. Allen acted as M.C.

Manchester.—On March 6 the third annual staff social evening, promoted by the district staff, took place at the Midland Hotel. The proceedings consisted of concert, whist drive and dance, and a most enjoyable evening was spent. The company, which numbered about 400, included visitors from surrounding districts, including Liverpool, Bolton, Bury, Oldham, Rochdale and Stockport. The whole of the arrangements were well organised by a hard-working committee, who are to be congratulated on the success attending their efforts. As in previous years, an agreeable feature of the proceedings was the part-songs rendered by members of the staff, under the conductorship of Mr. T. J. Clark.

Eastbourne.—The staff here held their annual dinner at the Royal Restaurant, Terminus Road, on the evening of Feb. 21, and spent a thoroughly enjoyable time under the chairmanship of the Local Manager (Mr. R. Curling), who read a telegram from the District Manager (Mr. F. W. Taylor, Brighton), expressing his regret at his inability to be present. "The Company" was proposed by Mr. W. S. Dawson (Contract Department) and responded to by Mr. Curling. A musical programme was presented by Messrs. Thompson and Hemstock, the following taking part:—Messrs. Bilton, Cole, Hill and Leete. Mrs. Hemstock presided at the piano. A whist drive brought the evening to a close. Mr. W. E. Moore was present, representing the district office.

Hull.—A smoking concert was held at the London Hotel on March 13 in aid of the Hull staff cricket and tennis club. It was well attended, and a very enjoyable evening was spent. The District Manager (Mr. C. C. Worte) was chairman, and in a short speech traced the history of the cricket club, which showed a decided improvement during the last two seasons. It is hoped that the team will be able to "lift" the Chamber's Challenge Cup at the next opportunity.

On March 16 the District Manager (Mr. C. C. Worte) gave a lantern lecture, to which all members of the staff were invited. Some very fine views were shown of quaint corners in Ghent, Bruges and York, woodland scenery, cloud and moonlight effects, along with studies of children, flowers, etc. A hearty vote of thanks terminated the proceedings, when Mr. Worte was thanked for the trouble he had taken in arranging for the display. Mr. Greenwood (Inspector-in-Charge, Beverley) officiated at the lantern, which he kindly lent for the occasion.

The telephone society's meeting held on March 9 was made the occasion of a public presentation to Mr. J. Watson of a silver teapot subscribed for by the operating staff, and an oak clock from the rest of the staff, in recognition of the celebration of his silver wedding. Mr. Watson has had a varied career, serving with the 1st Battalion 15th Regiment from 1876 to 1878, later volunteering for service during the time of the Zulu War in the 93rd Sutherland Highlanders, and entering the Company's service in 1900.

EMPLOYEES' HOSPITAL FUND—GLASGOW DISTRICT.

THE amount collected by the staff in the Glasgow district during the past year was £200, and this has been allocated as follows:—

	£	s.	d.
Royal Infirmary	37	10	0
Western Infirmary	30	0	0
Victoria Infirmary	20	0	0
Convalescent Home, Dunoon	20	0	0
Convalescent Home, Lenzie	5	0	0
Samaritan Hospital	5	0	0
Eye Infirmary	5	0	0
St. Andrew's Ambulance Association	5	0	0
Glasgow Maternity Hospital	5	0	0
Consumptive Sanatorium	5	0	0
Sick Children's Hospital	5	0	0
Quarrier's Consumptive Home	5	0	0
Cancer Hospital	5	0	0
Ear Hospital	5	0	0
Eastpark Home for Infirm Children	5	0	0
Quarrier's Home	5	0	0
Broomhill and Lanfine Homes	5	0	0
Sick Nursing	7	10	0
Ten per cent. to Benevolent Fund	20	0	0

GLASGOW DISTRICT NOTES.

IT was noted recently that a practice obtained among our operators of inserting cottonwool in the mouthpieces of their instruments with a view to absorbing the moisture, and it was thought that this had no bad effect on the speaking. The question was referred to the Engineer-in-Chief, however, who points out that the effect of this under certain conditions is equivalent to the addition of ten miles to the circuit. The practice has therefore been discontinued, and the point will no doubt be of general interest.

Owing to special circumstances in the telephonic history of Glasgow, rates were given and conditions offered which made the telephone service a cheap investment. For some time Glasgow had been in possession of a very liberal measured rate tariff, and the new measured rates were not hailed by the public with the same delight as they were in districts where a measured rate tariff was entirely new. It took some time and effort to popularise them. It is pleasing to record that the new rates have "caught on" and are rapidly coming into favour. During the past two months 232 subscribers transferred from the old to the new rates and during the same period 39 private branch exchange agreements were signed, consisting of 88 junctions, 225 stations and 375,850 calls.

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TELEPHONE MEN.

XXIV.—THOMAS ABRAHAM PROUT.

MR. PROUT is of good Cornish Methodist stock, but was born at Pachuca, Mexico, in July, 1866, and at the age of six was brought to England to be educated. After completing eight years schooling he left Trevarth School, where he had been a boarder, for his home at the little tin-mining village of St. Agnes, on the rugged north Cornwall coast, where his parents still reside. Here he continued his education and took courses in mineralogy and inorganic chemistry, and at nights, after the miners' boots had been mended, learned shorthand from a crippled but cultured shoemaker in the village. As a proof of the boy's determination and aptitude it is on record that after a few months' shorthand tuition he set off from St. Agnes one morning on his "boneshaker," rode across Cornwall to Falmouth, took part in a trial of speed and accuracy at the Royal Cornwall Polytechnic and rode back with £2 prize money.

Anxious to be up and doing, young PROUT, unknown to his parents, replied to an advertisement for a "junior clerk in a public company," which appeared in the *Western Morning News*, of Plymouth, in the autumn of 1881. His application was successful, and so, in October, 1881, he started his telephone career at Plymouth with the United Company, who had in July of that year opened an exchange with 60 subscribers on free trial.

In those early days of telephone enterprise the issue of complimentary passes, daintily made up in cream leather, to lady members of subscribers' families for the free use of public call offices is noteworthy as an early endeavour to cultivate the "telephone habit" amongst the gentler sex in the West of England and South Wales. Bazaars and other crude means of publicity were exploited nightly, and it was at first harder to get an exchange telephone free of charge into a good business house or public institution than later on to get £20, £15, or £10 a year paid for one. Up to 1885 it was not unusual to attract the first batches of subscribers by offers of free service for the first few months after joining.

Telephone exchanges had to be opened in some cases not merely without the co-operation of the Government, but in open defiance of it or in competition with it, even without a licence, as in the case of the Plymouth Exchange already mentioned; so that the staff working an exchange in the morning were often uncertain whether there would be any exchange for them to work as the day wore on. Under a threat of legal proceedings by the POSTMASTER-GENERAL the Plymouth Exchange was closed on Oct. 31, 1881, and negotiations for a licence went on for over three years before the POSTMASTER-GENERAL (the late Mr. Henry Fawcett) announced in the House of Commons on Aug. 8, 1884, that he was prepared to grant licences to telephone companies. In February, 1885, after a loss of three and a quarter years of valuable time, the Plymouth Exchange was re-opened.

After a few months service at Plymouth, Mr. PROUT accepted an offer to go to Bristol, where he remained ten years and was chief clerk, cashier, and practically assistant manager and secretary of Western Counties & South Wales Telephone Company from its formation in December, 1884, until its absorption by the National Company in July, 1892, when he was officially thanked for his "zealous and faithful services."

In November, 1892, promotion came in the shape of the first managership for the National Company's Bristol district, in which there were then 1,230 exchange and private lines, with temporary oversight of three other newly formed districts for the West of England, South Wales and Hants and Dorset. In March, 1894, the Bristol exchange subscribers were transferred to the first multiple switchboard in that city. After three years of interesting work as District Manager in that district, under Mr. C. B. CLAY, Mr. PROUT was, on the recommendation of the late GENERAL MANAGER, appointed to be District Manager of Mid Yorkshire, with headquarters at Leeds.

In January, 1896, the management of the Leeds district, in which there were then 3,000 exchange lines, was accordingly taken over, in succession to Mr. R. A. DALZELL. In 1897 a large scheme of underground work was carried out in Leeds on estimates

prepared by Mr. PROUT in conjunction with Mr. SWITHENBANK, the then Local Manager. In the course of this work Mr. PROUT suggested laying the Company's pipes in the same trench as the Leeds Corporation's tramway mains. Dr. JOHN HOPKINSON's objections to this were overcome and a sum of over £1,000 was thereby saved to the Company. Several new exchanges were canvassed for in Yorkshire and opened during the two and a quarter very pleasant years spent at Leeds under Mr. J. C. CHAMBERS as Superintendent.

In March, 1898, the Manchester district was entrusted to Mr. PROUT and after nearly five years' work during a more or less strenuous period of threatened opposition from municipal competition and an abortive new company, Mr. PROUT was in August, 1902, made Assistant Superintendent of the North-Western Province, and removed to Liverpool.

In nearly 27 years of telephone life he has accumulated a fund of reminiscences bearing on all phases of the telephone industry. Telephone development has all along been largely a question of finance. At one period in the life of the Western Counties Company the funds in the exchequer were getting dangerously low, to the worry and annoyance of the management. It seemed almost impossible to get anyone with money sufficiently interested in telephone work to advance it for development. Mr. PROUT, however, happened to call to remembrance a certain wealthy man who lived near the Land's End and who was regarded locally as a great financial power. With some trepidation a suggestion was made that this gentleman could, if he only would, come to the rescue. In desperation the suggestion was adopted, and Mr. H. F. LEWIS, the then General Manager of the Western Counties & South Wales Company, set off on his quest; much to the astonishment of everyone he returned without any delay with a subscription of £20,000, secured on satisfactory terms from a gentleman who had not up to then, in his own opinion, use for a single exchange telephone. Such a sum would nowadays not go far, but in the circumstances mentioned was of very great value, and it is satisfactory to know that the courageous investor has had no reason to regret his early investment in telephone stock.

Education has always been a subject of interest to Mr. PROUT, and he is to-day a keen student of all the latest developments in telephony. His interest has never been selfish, as during the past twelve years he has fostered instruction classes among the staffs in Leeds, Manchester and Liverpool, and this year is President of the Liverpool and Birkenhead Telephone Society and is President-elect of the Blackburn Telephone Society for the 1908-1909 session.

Mr. PROUT is a man of parts; his artistic talents and tastes have found expression in landscape painting, photography and music, but he avers that his best amusement and recreation arise out of his telephone work. As regards sport, he was, up to the date of his marriage in 1890, one of the most prolific try getters for the Bristol Rugby Club, in whose first team he played outside three-quarter; as wicket keeper he established a local cricket reputation; and at lawn tennis he played in the Leeds Club matches, and still takes exercise in this form on occasional Saturday afternoons, varying it with some gardening. One who knows Mr. PROUT well describes him as a "telephone encyclopedia," "a glutton for work, a man of tireless energy, who takes the longest stairs two at a time, who oftener runs than walks, and is seldom out of the reach of a telephone bell or separated from his heavily loaded dispatch bag."

A TELEPHONE MASONIC LODGE.

IT may be interesting to the Masonic members of the staff to learn that the Grand Master has granted a Dispensation for the formation of a Lodge to be called The Telephone Lodge, which is primarily intended for those connected with the telephone industry. The consecration ceremony will take place at the Gaiety Restaurant, Strand, London, on Friday, May 8, and the first regular meeting will be held on Saturday, May 16, at the same place. The three principal officers for the first year will be: Worshipful Master, Mr. F. O. Harke; Senior Warden, Mr. P. P. Kipping; and Junior Warden, Mr. S. J. Goddard.

C. E. Tattersall, *Treasurer*; Patrick Kenny, *Secretary*.

STAFF TRANSFER ASSOCIATION.

ON Saturday, April 11, 1908, Mr. ALSOP received a letter from Mr. KING, Assistant Secretary to the Post Office, asking him to call at the Post Office on the following Monday with one or two members of the association. Accordingly Messrs. ALSOP, BOLD, LOWE, and SCOTT (being four of the five members of the executive, Mr. VALENTINE, the fifth member, being prevented by the shortness of the notice from attending) called at the General Post Office and had a long interview with Mr. KING, Mr. OGILVIE, and other gentlemen, representing the POSTMASTER-GENERAL. The tone adopted was extremely friendly, and no doubt good will ultimately result from the interview. A *resumé* of the interview has been submitted to Mr. KING for his approval, which it is hoped will be agreed to in time to be published in the next issue of the JOURNAL.

THE SIGN OF THE BELL.

BY A. WARD, *Stores Department.*

THE choice of the bell as the Company's indicative sign is an appropriate augury of the future usefulness of the telephone. In the past the world's joys and sorrows, victories and rejoicings, have been made known by the tones of the clanging bell. There is hardly a period in life that is not in some way or other connected with the sound of the bell. We rise from slumber, we commence our labour, we finish our task, we are married, we are buried, and the bell has had its share in each proceeding. Our poetry and songs teem with references to the part played by the bell.

Does not the telephone promise all that the sign implies? Will it not in the future be the means of bringing to every home the news of victory and the safety of those dear to us? Have we not already heard of its splendid service in saving life from a horrible death from burning, of its assistance in bringing instant aid when an accident has happened? As in the past the dwellers in the towns and villages felt the security of living within the sound of the bell, so "the sign of the bell" will give that same sense of safety. To be within sight of the bell will mean help in case of danger, companionship when lonely, assistance in case of fire or accident.

'Tis true there have been those have persisted in ignoring the protection afforded by the signal pealing from the belfry tower, preferring to cherish and encourage some not-to-be-explained prejudice that the quiet serenity of the neighbourhood was disturbed, that they could get on very well without it. But do we not still find those who can only recognise the sign of the bell as a fresh cause of worry and the telephone as an unmitigated nuisance?—quite overlooking and forgetting its usefulness and good service. Time, however, is gradually revising such opinions, and proving by the hard facts of experience that the telephone service is a most powerful help in enabling a closer grip to be taken of the various levers controlling the intricate business machinery of to-day. In every street, in every lane, the sign will be displayed, cheering all with the thought that no matter how far they may be from home, with the telephone's aid distance is nought.

SMART CANVASSING.

THE daily papers of April 15 reported a sharp struggle between the Rev. Edward Denny, vicar of St. Peter's, Kennington, with an alleged burglar whom he found in his bedroom. A representative from the South Eastern (London) Contract Department called immediately upon the Rev. Edward Denny and secured from him a message rate order.

THE VOICE OF HIS CONSCIENCE.

A COUPLE of young lawyers were just shutting up shop to go home one evening not long ago. It was in a big building, and as it was about nine o'clock, nearly all the windows were dark. One window across the alley, however, was light, and the curtain partly up, and just after they had turned off their own lights the two young fellows saw a man who was dictating in this room reach over and kiss the stenographer. They knew the man's name, that is, they knew the name lettered on his window; so they looked him up in the telephone book and one kept watch at the window, while the other rang him up.

There were signs of perturbation in the room across the way when the bell rang. When he finally answered, the young fellow at the 'phone said: "Stop kissing that girl."

"Who—who are you?" came a quavering, stuttering voice over the 'phone.

"I am the voice of your conscience," said the lawyer, and silently hung up the receiver.—*Telephony.*

THE VALUE AND APPLICATION OF THE SCIENTIFIC SPIRIT.*

BY A. B. GILBERT.

THE recent cry of encouragement, enthusiasm and co-operation is perhaps responsible for the few notes I have put together for to-night's meeting. I do not in the least degree want to lessen any stimulus for good we have derived from the writings that have appeared in our JOURNAL, but rather to add something to the writing on the wall—something which, to my mind, stands far above any of the three topics referred to, and which, I venture to say, is of greater importance.

My subject, "The Value and Application of the Scientific Spirit to our Work in general," may be above the lay mind to discourse upon, but I have merely committed to paper a few elementary thoughts on the matter, and I submit them to you with every apology for their feebleness. I merely ask that we consider them together for a short time, and perhaps by so doing the value of the scientific spirit may be made a little more forcible to us.

What is the meaning of the scientific spirit? First of all, it would be well to try to define the meaning of the word science. Science is not a title which belongs only to some particular branch of enquiry, or to some particular kinds of knowledge. What is generally meant by science is not simply knowledge, but systematic knowledge, as opposed to loose popular knowledge. All knowledge which is deep enough to touch the cause of things can be called science; and all inquiry or investigation into the cause or reason of things is scientific inquiry or scientific investigation.

Now the scientific spirit is a mental attitude, and may be described as the eager searching spirit, or the passionate desire to know the truth. It is sincere, critical thought which admits conclusions only when they are based on evidence. The scientific spirit will not admit or recognise the rough and ready record, the second-hand evidence, or the vague impression.

In the August number of our JOURNAL the meaning of the scientific spirit is very aptly described. If you failed to notice the paragraph I suggest you should turn it up; but if you read it then I suggest it will bear reading again. We are told, to put it in a few words, that the scientific spirit is a method or an attitude that we can adopt in our work, or in facing any problem we may be called upon to deal with. It is the conviction that in every matter there is to be found the truth, and we must get at the truth by diligent searching for facts and weighing and balancing them all up, and laying on one side anything that savours of chance, imagination or guesswork.

The man who wants to approach and attack his work or problem in an effective manner can only do so by possessing the scientific spirit. If he does not possess it he can cultivate it, and if he fails to do this his work will amount to misapplied energy. Enthusiasm and co-operation will doubtless tend to efficiency and economy in a minor degree; but the scientific spirit applied to investigation will produce the highest possible efficiency and the greatest possible economy; in fact, its mission is both.

Scientific investigation will produce the essential factors involved in planning a scheme, whether it be a new building, an underground scheme or a switchboard. It will show up inefficiencies so that remedies may be applied. It is a critical analysis of conditions, and applies equally to all departments of our business.

Let us now turn to the application of the scientific spirit.

A short time ago I came across an article on the Housing Question, and in it English cities were compared with German cities. The article stated that our English cities are permitted to grow automatically, without investigation, thought or regulation. The result was great waste, congestion at some points, whilst at others land is going a-begging, an absence of direct streets, and so on. In the case of the German cities these are planned years before they are built, and everything is arranged to fit in without waste, congestion, and so forth. Now this naturally strikes one—we will assume the statement to be true—as an indication that scientific methods are not applied to the building of towns in this country as in Germany.

Apply this idea to our work and as an example take the case of line plant, which constitutes about 70 per cent. of the capital of any telephone system. Are we content to allow this to grow automatically? If we did, what would be the result? Well, it would result in great waste—which means unproductive capital, acute congestion—which spells bad service and costly upkeep, and eventually costly reconstruction, with its loss in scrapping or tearing down what should be useful plant.

Now the very opposite of letting things take care of themselves is the subject of my paper. The problem of telephoning a large town efficiently and economically is a very complex one, and can only be taken in hand by the aid of the scientific spirit. Ordinary common sense will not alone suffice in designing line plant, or any other plant, even after possessing the necessary technical knowledge.

I have just mentioned that congestion means reconstruction, and reconstruction means tearing down plant that perhaps has only been in position a few years. I should like you to see what this means. If we spend, say, £100 on the erection of certain poles and wires, the useful life of that plant is assessed, say, for example, at twenty years; that is to say, under ordinary circumstance it will render service for twenty years before it is necessary to replace it with new material. Obviously if we remove the plant at any period prior to the end of its useful life we incur a loss, and that loss has to be wiped out by incurring a charge against revenue. As an illustration take the case of plant costing £100; if we scrap it, say, at the end of five years, the value of the poles and wires in position may be, say, 80 per cent. Thus we involve ourselves in a loss of £81, from which we must deduct the value of the more or less scrap material—say, a loss of £60. Now imagine two cases of this class of scrapping a month in a district, and it means a loss of something like £1,500 a year—the revenue of a good many contracts.

It is well to have in mind when we speak of an annual revenue charge what it really represents. A good way of thinking of it is to assume the capital value of the charge. For instance, £1,500 a year is a 5 per cent. interest on £30,000. Try to think of some building or plant that provides a 5 per cent. profit, and is valued at something like £30,000. I believe the value of a trunk line from Glasgow to London is somewhere about this figure, and assuming there is a 5 per cent. profit, then in the case of our cost of scrapping we can liken it to the trunk line between Glasgow and London. Putting this another way, if we owned the trunk line and made a nett profit of 5 per cent. it would be all swallowed up to provide for the scrapping I have assumed, which ought largely to have been avoided.

I do not mean to argue that it does not pay in some cases to scrap the existing plant. In certain cases for engineering or physical reasons it is imperative to scrap, but a scientific study originally would no doubt have prevented in a measure the large amount of scrapping which possibly goes on up and down the country every year.

The basis of design of line plant, switchboard plant, office and exchange buildings is development. Development belongs to the commercial side, and should be made the subject of a careful study. It is for the commercial side to say what development it anticipates. The rate of growth, the location of that growth, and the class of service must be forthcoming with some degree of accuracy. We cannot forecast development by any process of guesswork, and a prediction must be founded on a scientific study. Accurate records should be kept and labelled "Development Records"; they should be kept constantly, and anything noted that is influencing development. A critical analysis should be taken, and the results tabulated each three months. Figures and facts alone are wanted.

And further, the calling rate, the destination of calls, that is the percentage of local and junction traffic, for house and business service should also be recorded. The calling rate might be noted as it applies to different classes of houses. Then as part of a development study plans showing existing subscribers and the number of possible subscribers in blocks are wanted, and also the possible subscribers to be expected from vacant land under building development

The result of such a study, which I have merely outlined, would make it possible to predict within fairly close limits what development to plan for, for any period ahead, either for the system as a whole, or an exchange area, or any unit of it. One thing is clear, we have got to answer definite questions as to what development we are to provide for in our design of plant, buildings, etc, and prediction based on solid facts relating to the past will stand infinitely more chance of approximating the future conditions than superficial investigation. All this valuable information is one of the results of the scientific spirit.

To illustrate the need and value for such a study as I have suggested take the case of a new exchange. Land has to be purchased when it is decided to erect a new building. For the correct centre or position for the exchange we have to turn to the location and density of the development. The amount of land required and the size of the building depends upon the ultimate number of lines to be provided for—this has to be answered by the development study. With regard to the building the floor space for the switchroom and apparatus rooms is decided by the ultimate number of lines. With regard to the switchboard the equipment depends upon the traffic and the traffic depends upon the class of development. Even in the design of power plant the capacity of the storage battery is based on the number of calls, and the daily current consumption is calculated from these and other figures.

The few items I have just mentioned only relate to the Exchange itself and similar questions have to be answered for the design of the line plant.

Let us consider the subject of the line plant a little further. Line plant merely consists of two isolated wires joining a subscriber with an exchange, but excepting in very small towns the two wires have, for physical reasons, to be carried either in aerial or underground cables, and therefore we are forced to provide such cables in advance of actual requirements. Consequently we are face to face with a problem of some magnitude, inasmuch as we have to decide the amount of cable to lay down, the direction and termination of it. Before designing the plant a great number of questions have to be answered, and they are not such as can be easily disposed of, and moreover they are not such as can be disposed of in any other way than in a scientific way.

The application of scientific methods to the design of line plant has brought about a condition whereby capital can be utilised to meet the demands of development upon a strictly economic basis.

What I mean by this is that with the introduction of scientific methods, after assuming a certain development will take place, the plant is so designed to meet the ultimate growth, but only a portion of it is laid at the outset, the balance being deferred till required. Now this means that we have not a lot of plant lying idle, which would represent so much unproductive capital, and as the plant laid in the first place can be added to as required without loss in scrapping, we have what is known as an economical lay-out, which in other words means that the amount of money required to provide for interest, depreciation and maintenance is a minimum one.

Whilst putting these few notes together I read in the local paper that a new block of shops and offices was to be erected at the corner of Sauchiehall Street and Wellington Street (Glasgow). It was stated that the intention meantime was to erect a limited number of offices only, but the building would be designed to be capable of being added to in the future as the demand warranted. By this means it was stated that the proprietors would not have a lot of capital "eating its head off," and at any time in the future there would be no difficulty in adding floors without in anyway interfering with the first portion of the building. Well this is what one may call scientific methods applied to building, and the lay-out of the building is an economical lay-out.

Our idea of economy must not be limited to cutting down the number of men engaged on a piece of work, or reducing the time taken by a man to clear a

* Abridged from a paper read before the Glasgow and West of Scotland Telephone Society.

ANALYSIS OF LINE FAULTS FOR SIX MONTHS.

Month.	Broken wires.	Short circuits.	Contacts.	Caused by trees.	Bad joints.	Broken leads.	Disconnection in line fuses.	Working faults.	Found O.K.	Earth wires.	Earths.	Faults in cables.	Total.	Number of lines in centre.	Percentage of faults per line.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.			
November	490	155	175	17	12	28	85	80	105	9	110	6	1,272	4,587	·25
December	285	124	126	19	4	62	143	77	101	8	68	3	1,020	4,621	·22
January..	160	175	127	9	7	81	87	101	147	20	55	8	977	4,631	·21
February	122	97	81	12	3	48	79	109	140	12	37	3	743	4,658	·15
March	115	66	75	7	2	38	93	87	115	7	29	4	638	4,745	·13
April	126	85	61	5	4	26	52	94	94	10	16	7	580	4,759	·12
	1,298	702	645	69	32	283	539	548	702	66	315	31	5,230	..	1·08

TABLE 1.

fault or enter up a book. That is one class of economy and of course important in itself, and I should just like to give you an example of economy in the matter of labour, which perhaps has a little of the scientific spirit in it. Thomas Brassey, the father of the present Lord Brassey, was a great railway pioneer. He laid down nearly 7,000 miles of railway track and was one of the most successful exploiters of labour by navvies. In France on one occasion he had a large contract to fulfil, in the execution of which he engaged French navvies. They did not give satisfaction, and he had great faith in the British navvy, and so he imported thousands of these into France. They cost nearly twice as much in wages as the Frenchmen, but he found that by feeding them on roast beef and beer they did three times the amount of work.

There is another class of economy in our work which perhaps, if anything, is the more important of the two, as it enhances wider possibilities of saving. I refer to the design of plant. It should be borne in mind that we cannot proceed to make any calculations until certain questions relating to the prospective development have been answered, and on those answers the degree of economy rests. The line plant question is such a wide one and such a complex one, especially in a city of a million of people, that one is perfectly safe in saying that no common-sense method, or rule-of-thumb work, will aid us in planning efficiently and economically; and the value of the scientific spirit in this branch is beyond question.

Let us consider for a moment how we can turn the scientific spirit to the question of maintenance economy. A man says to himself "I know this ever-present subject has been attacked before"; nevertheless, he applies himself again to the question of line faults, with the express idea of getting at the exact state of affairs. For a period of six months he analyses the cause of all line faults and allocates them under various headings for each of the six months on the lines of Table 1. The investigator then has before him the cause of all faults for a considerable period, and he proceeds to establish certain facts, and finds, for instance, that broken wires form the most serious item for consideration. He then finds that short circuits account for the next highest number of faults, and from observations taken of this class of fault for a period of three months the fact is disclosed that the greater part of the faults were found to occur in the span to the subscribers' premises. The analysis shows up some apparent weakness in line fuses, as no less than 539 faults were due to a disconnection in this fuse. From this the investigator moves along his problem and proceeds to find out by observation or experiment the exact cause of the most important items with a view to applying a remedy. Here, then, we have an example of the scientific spirit and its application.

To my mind no testroom can be said to be up to date that fails to make some periodic study of the cause of faults. It is one thing to know the number of faults that occur, but it is quite a different thing to know the cause, and without knowing the cause we shall not move in the direction of reducing the disturbance to the service, and what is equally important, reducing the big annual expenditure involved in the upkeep of our plant. Very often it is only when a man is asked to write a paper, or thinks of writing one, that he really looks into such things as these.

It is more important now than formerly for scientific methods to be adopted, as the message lost through service not being available—on account of breakdown—means so much lost revenue under the new conditions of service provided by the measured tariff. Our aim should be in the direction of constructing our plant substantially, and of such material as will eliminate the faults we are subject to now, rather than to formulate some organisation which will reduce the time required to clear the faults. A further point in this matter is that high grade service constitutes an advertisement in itself.

For the year ending June we had 19,507 line faults in the district. Now the cost of clearing a fault is much more than one might imagine. I do not know what the figure is for Glasgow, but for one of our large towns it is calculated to be just about 4*s*. Of course 4*s*. is not merely the time and material required to adjust the disturbance. It is that plus its proportion of such things as rent, rates, office charges, administration, and so on. Assuming this figure of 4*s*., then our faults cost approximately £3,900 a year. Let us capitalise this money as we did in the case of the loss in scrapping. Imagine a building that shows a 5 per cent. nett profit or thereabouts, then its value would be something, say, between £70,000 and £80,000, and one can liken the money involved in clearing faults to the new "Anchor" Line buildings in St. Vincent Street with the land, which was very costly, or to be nearer the mark, a building and land half as large again.

Turning for a few moments to the machinery which manipulates the telephone message—I refer to the switchroom—I suppose there is no doubt in anyone's mind that very great strides have been made in this department of late years. The progress has been very largely due, I should say, to the practice of scientific methods. It may be that the subject of switchboards and methods of operating lends itself to a critical study better than others. All the factors and conditions are marshalled together, as it were, in one room, and there is now no necessity to observe the condition of the service from the subscriber's end of the line. The observer, or the critical eye and mind, can gather all the necessary data from a single room. Then, again, the line and instrument plant is out of sight so to speak, that is, away from the central office and stationary; whereas the main switchroom is a moving, active mass, and perhaps conditions and methods for this reason are more closely analysed.

An up-to-date switchroom is a great machine working in complete harmony and turning out an article—the message—which has attained a very high grade. Of course, the advancement in this department has been a matter of gradual evolution, but it is well for us in other departments to ask ourselves if an evolution is taking place with us.

Many of you know the large number of returns and figures that are now prepared relating to switchroom work, and all these are costly; but the spending of money in the collection of scientific data has been productive of great progress in the matter of design of apparatus and equipment: very considerable economy in operating it; and high efficiency in the handling of the traffic.

As illustrating this I refer you to two curves. The first one, Fig. 1, relates to the speed of answering calls in a large exchange. The thick black line represents the average result for the whole exchange, and the dotted lines individual team working.

You will note the improved condition with the change from an old switchboard to an up-to-date one; and then towards the end of the curve you will see a further improvement effected, which is due to improved work arising from a knowledge of conditions.

I might mention, as examples, that in two exchanges recently changed from magneto to common battery working very considerable economy has been effected. In one case 44 operators' positions were reduced to 35 and 10 per cent. more lines added; and in the second case the cost of operating per call has been reduced. Of course the change to common battery working has been made possible by the advancement of the art of designing switchboards; but in reality the scientific spirit has been the original cause. However, I might say that it has been demonstrated in more than one exchange that a high grade of service does not alone depend upon new and up-to-date equipment, and such equipment would not have been anything like the value had it not been for the studies and scientific methods adopted.

In a paper on operating matters at last year's Officer's Meeting a curve appeared relating to the recording of message rate calls. You will see from Fig. 2 that although the number of lines remained stationary the number of recorded calls shot up in a very marked way at the point where the conditions of recording these calls was investigated. The true facts were laid bare and working methods were adjusted, with the result that the revenue went up with a big leap, representing an increase of between £400 and £500 a year.

Before leaving my few remarks concerning the service side of our work it may be justifiable to incidentally refer to the measured rate service. The new measured rate is essentially scientific as being based on true conditions. It has

as one of its objects the removal of the anomaly which exists in a very pronounced manner in the form of one man helping to pay for another man's service. The measured rate will enhance the reputation of the service by making a man more accessible, more get-at-able, as frivolous calls will be eliminated and cheap auxiliary lines will be at the disposal of big users. I think one might say that a deeper knowledge of the causes which operate against universal development—that is, a general and ready acceptance of the service by small householders and people in a small way of business—and the highest class of service has led the Company to change its methods of charging from what might appear to be a common-sense way to a scientific way.

There are many more points one might mention as illustrating the value of the scientific spirit, which promotes scientific methods and scientific working, but I fear I shall be voted as being too long-winded if I say more under the heading of switchroom and service.

It is difficult to suggest in what substantial way the scientific spirit can be applied in the office or accountants' department, and perhaps it may not be within my province to do so. However, it would seem that the department that controls in a measure all other departments, and has access to all the records, figures, and returns which are prepared in connection with the whole of the Company's business, should find it within its power to add the pursuit of science to its list of achievements. It is quite certain that Head Office welcomes at all times valuable suggestions, and valuable suggestions are not by any means limited to methods devised for saving entries in a ledger, for instance, which result merely in the saving of a clerk's time. Such suggestions, of course, have a value, and are not by any means to be discouraged. The application of the scientific spirit has a distinct value in small matters as well as in large. It has the power of showing up waste in any form, and you have already an example of this in the matter of postage. For instance, the method adopted experimentally of handling certain correspondence with people who have telephone service, by the use of the telephone instead of the penny post. The cost of conducting this portion of the correspondence, which can be saved in a big office, is appreciable. It represents waste, and is therefore a loss, for it is continuing to do something that is superfluous, or that can be handled as satisfactorily in another way at considerably less cost.

I would suggest that all office staff can adopt that attitude in their work which aims at bringing out the true state of affairs concerning any branch or section of our business. One's conception of the possibility of reform or progress, arising from a critical analysis of office work, should not be limited merely to departmental economy. A very much larger and broader conception is possible; and if one first of all accepts this view and then adopts the scientific spirit far-reaching results may still yet accrue.

To illustrate this I shall turn to an outside example.

In a financial paper called the *Statist*, early in the year, a very able article appeared on British railways and the results of scientific methods of working. It compared the results of the working for 1906 with those of 1899 in the case of two English railways—the London & North-Western and the North-Eastern. In the year 1900 new methods of operation began to be introduced, chiefly in the direction of compiling what is termed scientific statistical data. Hitherto the figures and facts and conditions relating to the various departments and branches of the service were neither complete, nor exhaustive, nor deep enough—they did not touch some of the things that held the key to the situation. They were not able to tell how much money they spent on each and every item they had to maintain and repair; they did not know if they were getting value for the money expended; and they could not measure the work done for the money paid out. In other words, their methods were not scientific.

Now, the North-Eastern Railway since 1900 has adopted the new methods, but the London & North-Western Railway still clung mainly to the old system of working. It was pointed out that the new methods had been responsible in the case of a number of foreign railways for very great reductions in the cost of conducting certain sections of their work. In conclusion, the *Statist* affirmed that had the London & North-Western Railway effected as much economy in the administration of its system and in the handling of its traffic in 1906, compared with 1899, as the North-Eastern Railway secured its profit for the year 1906 would have been something like half a million of money greater than it was. This, no doubt, is a very bold statement; but the article is very interesting and highly instructive in a general business sense.

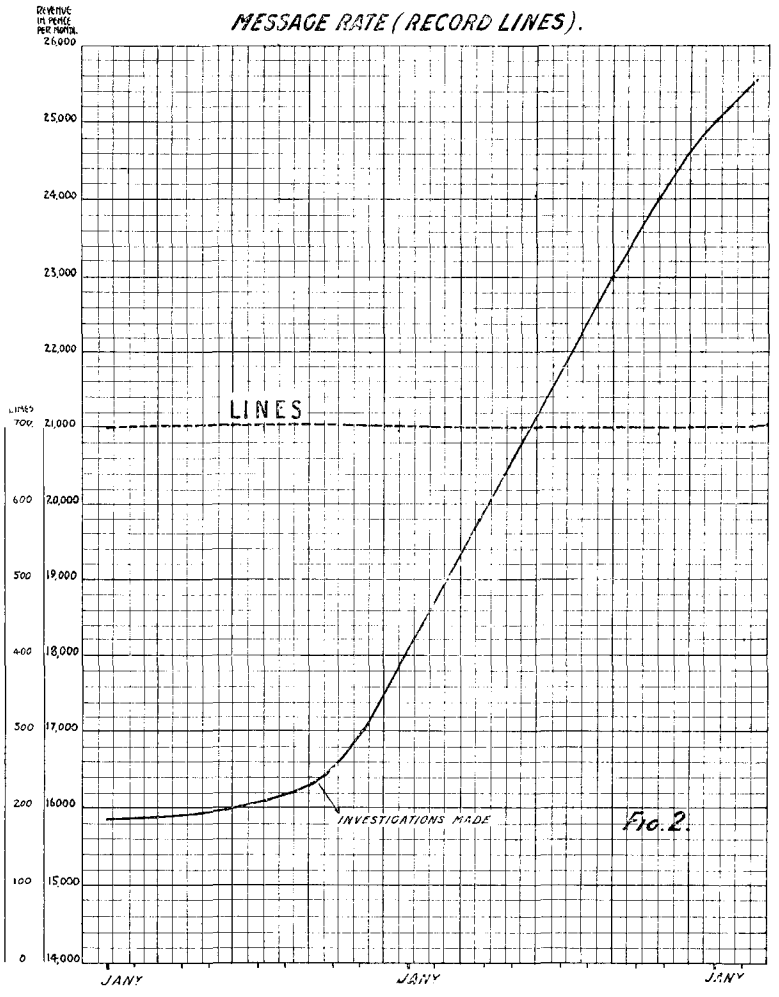
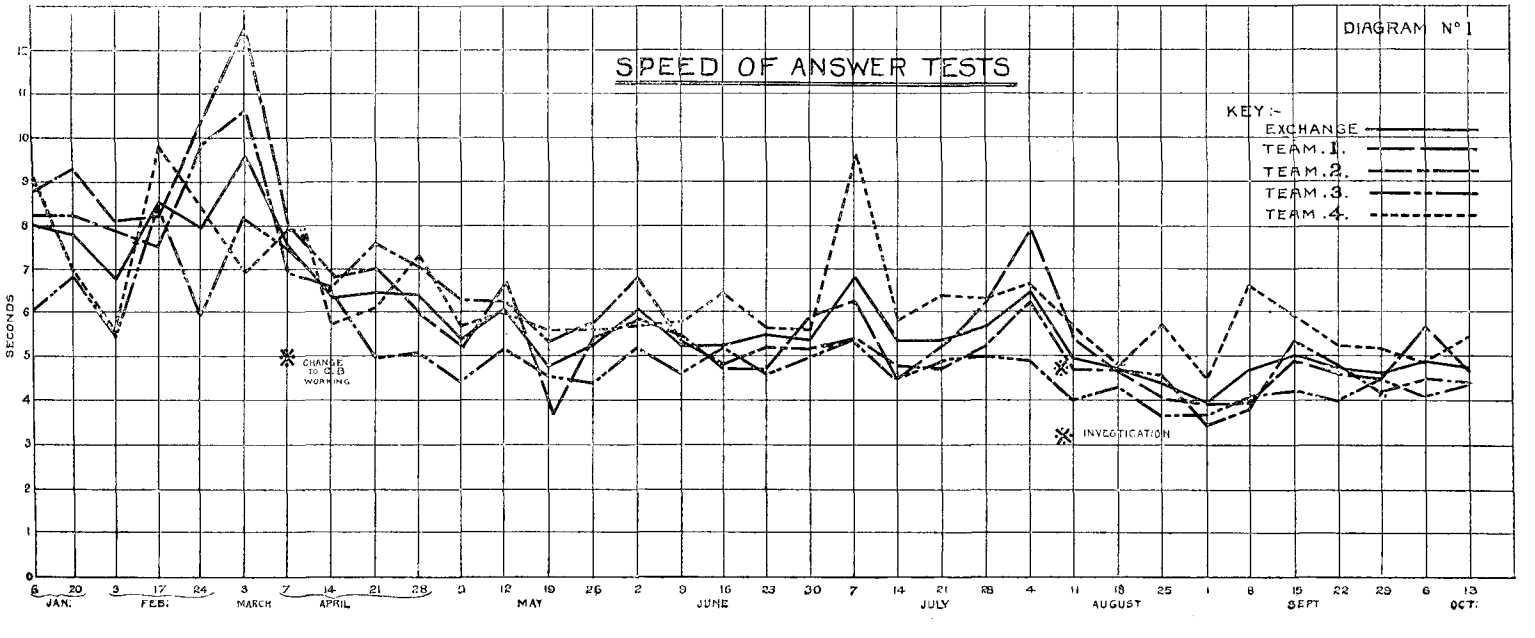


FIG. 2.

In conclusion, I would say that I have not touched on the great question of transmission, with all its future possibilities, as this belongs more, perhaps, to the order of scientific research.

Scientific investigation, which is the outcome of the scientific spirit, is not by any means new to the Company's business, as you will have noted by the few illustrations I have endeavoured to put before you, and your knowledge of the



work in your own departments. It has already been responsible for much increased efficiency and the practice of economy.

However, there is still a wide field for ambitious men, and it is possible for all of us, given the ambition, to add our names to the roll of truth-searchers. We must cultivate habits of independent thought and ideas of free inquiry; the rule-of-thumb work of our predecessors will no longer hold good if we are to progress.

One thing more: the scientific spirit will not crush a man's individuality—cut-and-dried systems work in this direction—for it will tend to make a man step beyond the Service Instruction and so provide a solution to matters upon which no legislation has been provided. And further, it will allow us to seize opportunities which will remain dormant under ordinary observation or investigation.

I hope you will agree with me when I say that we have got to convince ourselves that this attitude or method is the only one to present to our work in general and our problems in particular. We all want to adopt it—not a dozen of us; and we want to apply it in all departments and to all things. It will result in splendid progress, increased efficiency, and careful expenditure; and in such an undertaking as the telephone system it is the only method by which, in the face of the increased cost of working a growing system, we shall be able to forge ahead and so take our place in the great forward movement of the electrical and commercial world.

TELEPHONE WOMEN.

XV.—EDITH ANNIE TROTT.

MISS TROTT entered the Company's service on March 11, 1899, so that with so comparatively short a term of service she is to be congratulated on her selection in the March of last year to fill the

EDITH ANNIE TROTT.

onerous position of Clerk-in-Charge of the Brighton Central Exchange, a selection fully justified by results.

Miss TROTT is a thorough official, and when it is remembered that Brighton and Hove Exchanges stand at the top of the National list showing the percentage of speed in effecting operating connections, it must be realised that this result is largely due to Miss TROTT's efficient control. She is, however, very popular among the staff, and is always ready to support any social movement among the operators, whose representative she is on the committee of the Brighton Staff Benevolent Society.

With only nine years' service, Miss TROTT has naturally seen fewer changes than most of the ladies hitherto referred to in the JOURNAL, but, even so, the difference in operating conditions between 1899 and 1908 is immense. In 1899 Brighton had an old mixed-circuit board with drop indicators. When party lines were introduced there were no transfer junctions, and the various orders had to be called across the room. In 1899 there were about 600 stations connected to Brighton Central Exchange, and less than 1,000 in the Brighton area, while the returns at Dec. 31 last show that the figures had grown to 2,163 and 5,621 respectively. In 1899 the head of the Brighton Operating Department was the Clerk-in-Charge, who exercised jurisdiction over Hove and Kemp Town, and in a modified degree over the other exchanges in the area, the remaining staff being simply "operators." To-day the exchanges in the Brighton area are controlled by a Traffic Manager, Miss TROTT having charge of the Central Exchange, with three supervisors and a monitor to assist her in her duties. There are five "B" positions, a two-position monitors' table, and three-fourths of the junction traffic in the area pass through this exchange.

Although Miss TROTT's telephone experiences may not be very varied, they are very vivid, having regard to the competition with the Corporation and the idiosyncrasies of the resulting class of subscribers, there having been 1,500 ten-party lines alone erected in the Brighton area, with a commensurate increase in other classes of service.

XVI.—CATHERINE MABEL WEBB.

MISS WEBB entered the Company's service on May 8, 1893, as an operator in the Brighton Central Exchange which was then situated in West Street. At that exchange Miss WEBB has seen many different workings of switchboards, her first experience being with a board with hanging transmitters, receivers on hooks, and large drop indicators. At this time the London trunk line was working direct to the Brighton Exchange, and subscribers speaking between the two towns were switched on direct from our own exchanges, the Company renting the wire from the Post Office.

CATHERINE MABEL WEBB.

Miss WEBB has mostly been associated with the Hove Exchange, although in 1903 she was transferred as Supervisor to the Brighton Central Exchange, being re-transferred to Hove at the end of 1904 as Clerk-in-Charge, a position which she still retains. At Hove, during Miss WEBB's experience, three different switchboards have been in use, and in 1906 she assisted in the change over to the present splendid central battery system which has made this and the Brighton Central Exchange models for the kingdom.

During the last few years the telephone industry in Hove has made rapid strides, as is shown by the fact that on Miss WEBB's first going to the exchange in that town there were less than 200 subscribers working, whilst there are at present between 1,400 and 1,500.

Operating, too, is vastly different nowadays to what it was during Miss WEBB's early experiences, the work at present being much more simple and the operators having a great many more comforts than were ever dreamed of in the old days. In the old days of the South of England Telephone Company, the Hove Exchange had only about two operators, while at the present

moment it has eleven operators with a supervisor and clerk-in-charge.

This exchange shares with the Brighton Central Exchange the distinction of showing the highest percentage of speed in operating calls in the kingdom, and it goes without saying that such a result cannot be obtained without an efficient clerk-in-charge. Miss WEBB has her work well in hand, but is at the same time fully able to participate in the joys and sorrows of those under her, and she is a very popular figure at Hove and in the neighbouring town of Brighton.

AN ANNIVERSARY.

(SOUTH SIDE FIRE, MAY, 1902.)

BY GEORGINA SMITH, *Clerk-in-Charge, Argyll Exchange, Glasgow.*

IN connection with the suggestion in a recent issue of the JOURNAL that a record of the anniversaries of important events in the Company's history should be shown monthly, it may be interesting to your readers in these days when fire drill and precautions

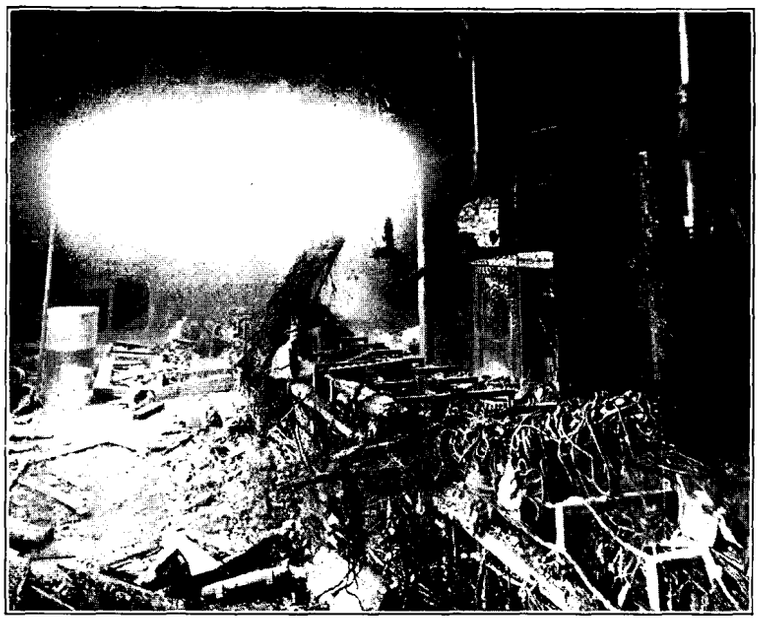


FIG. 1.

against fire have almost reached perfection to know how the staff of the South Side Exchange, Glasgow, escaped from the fire which took place there some years ago.

On May 20, 1902, about 11.50 a.m., the operators and inspectors of that exchange were startled by a noise in the outer entrance to switchroom. At this time the switchboard was being changed over from the call wire system to the new lamp calling and clearing, which necessitated an enlarged staff of inspectors and workmen. I think in all there were about sixteen people in the switchroom. The electrician-in-charge opened the door to see what was causing the noise, when, to our horror and dismay, we were confronted with a wall of flame. The switchroom was on the top flat, and was entirely lit by roof lights, with the exception of one small window which opened on to the roof. The usual means of exit, which under ordinary conditions were quite adequate, being cut off, the only way of escape was by the window. Notwithstanding the number of persons, the limited accommodation of the room, and the smallness of the window, there was no panic. Every operator left her board quietly, walked to the window, and waited her turn to get out. Some of the inspectors broke the roof lights and got out that way. The smoke by this time was rolling in thick, black clouds through the switchroom, and we were nearly suffocated.

Having managed to get out on the roof, and not being accustomed to roof navigation, we had some difficulty in reaching a place of safety. After exciting adventures, we were driven to our several homes, and hope this may be our last experience of a switchroom fire.

FIG. 2.

Photographs are given showing (Fig. 1) the charred remains of the switchboard, indicating the thorough nature of the fire; (Fig. 2) the temporary switchboard which was erected in position three days

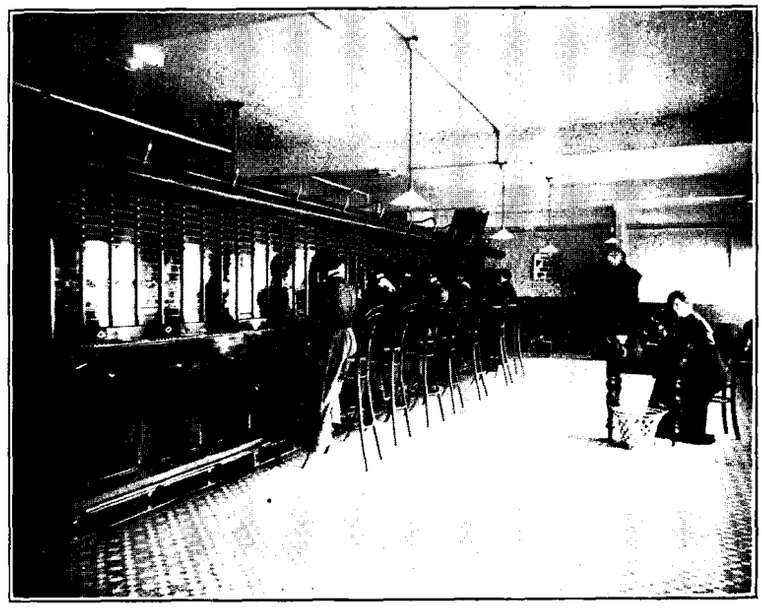


FIG. 3.

after the fire, the work of which was materially helped by willing hands from the Head Office: and (Fig. 3) the new switchboard fitted with up-to-date plant.

AN INCIDENT.

ONE day recently a little lady of about twelve entered the Contract Department at Edinburgh, bearing a note from a dressmaker requesting the receiver of it to telephone a message to a customer of the writer. This was, of course, done; and a few days later a two-party measured rate agreement from the writer of the note reposed in the archives of the district office. This was not the end of the matter, however, for a partner had to be found and was quickly secured in the person of a near neighbour who had for long been seeking one like-minded to join him on the two-party system. Two stations were thus secured.

FOREIGN INTELLIGENCE.

Austria.—According to the *Zeitschrift fur Post und Telegraphie* the State telephone system at Jan. 1 comprised 641 exchanges, 1,203 public call offices, and 66,513 telephone stations. The trunk system consisted of 257 trunk lines, with a length of 16,563·309 kilometres. This shows an increase since Oct. 1 last of 56 exchanges and 3,728 stations.

France.—The latest official convert to the measured-rate principle is the Government of the French Republic, which, in a Bill authorising expenditure on the reconstruction of the Paris telephone system with central battery plant, speaks as follows on the general question of telephone rates:—

"It should be stated that the flat-rate telephone tariff is most inequitable, as it requires all subscribers to pay the same price, whatever the number of calls made by each of them. The most rational system of tariff is that in which the price is proportionate to the service rendered—that is to say, that which requires each subscriber to pay in proportion to the number of calls he makes. There is no technical reason why such a tariff as this should not be adopted in the Paris system, and efforts should be made to satisfy public opinion, which for a long time past has emphatically demanded the adoption of this measure."

It is stated in the Bill that measured rates for telephone service are already in force in France in towns of less than 80,000 inhabitants, with good results, and it is recommended that the measured-rate tariff should be adopted not only in Paris, but in the other sixteen French cities of over 80,000 inhabitants.

Germany.—The *Z. für Schwachstromtechnik* records meetings of Merchant Elders of Berlin, the Berlin lithographers and flower-dealers, the Bavarian Chamber of Commerce, and the Chambers of Trade in Breslau, Cologne, Elberfeld, Barmen, Solingen, Lennep, Chemnitz, and Geestemünde, protesting against the proposed new rates. It will be remembered, however, that at the conference between the representatives of the Chambers of Trade, Commerce and Agriculture and the officials of the Imperial and Bavarian Post Offices on Jan. 7, the proposals of the Government were approved with trifling variations. The sore point is the increased cost to the large user, who will not, as he will in this country, be allowed to continue his existing contract.

Nova Scotia.—From the *Monthly Bulletin* published at Halifax by the Amalgamated Telephone Companies, we learn that at the end of February the Nova Scotia Company had 5,940 stations (of which 2,850 were at Halifax), the Valley Company 922, the Eastern Company 1,444 (712 at Sydney), and the Yarmouth Company 378, making a total of 8,704 for Nova Scotia.

THE "POST OFFICE ELECTRICAL ENGINEERS' JOURNAL."

IT is with very great pleasure that we welcome the appearance of the *Post Office Electrical Engineers' Journal.*

The first number is a very interesting one and augurs well for the future of the journal. The bulk of the articles relate to telephony, there being three dealing with telegraphs and seven with telephones. After a foreword, words of welcome by Sir JOHN GAVEY, C.B., and editorial, there are three telegraph articles—one on "The Polarised Sounder," one on "The Common Battery Duplex Telegraph," and one by D. MURRAY on "The Typewriter and Piecework in Telegraphy." This last is a very interesting sketch of the advantages which have been found in the United States to accrue from the use of typewriters, and it also gives figures showing the amount of work accomplished by telegraph operators in that country.

The first telephone article is by W. NOBLE on "The Telephoning of London" (not a very well chosen title, seeing that the article only deals with the Post Office system, *i.e.*, less than one-third of the total stations in the Metropolitan area), in which he shows the steps taken in the study for seven years' development when the work was first undertaken, and commences a good description of the works.

G. F. PRESTON has an interesting article on "The Growth of the Post Office London Telephone System." The interesting fact is revealed by Mr. PRESTON'S figures that the Post Office rate of growth in London is declining; tested as a percentage the rates of growths for stations are 136, 55, 39, 24, and 21 per cent. respectively for the five years ending Dec. 31, 1907, the actual net additions of stations being for the same years 8,007, 7,880, 8,738, 7,564, and 7,872 respectively. The year 1905 was thus high water mark.

By a printer's error it is stated that there were at Dec. 31, 1907, 46,355 *extension* stations; obviously exchange stations was what should have been printed.

M. RAMSAY contributes an instructive description of "Common Battery Transmission Systems," which include the W. E., the B. I., and the Stromberg Carlson (General Electric). We notice two printer's errors in this article. Fig. 5 refers to *special* limit; this should apparently be "speech" limit; in Fig. 8 the primary and secondary of the operators' instrument are shown in contact. It would have been interesting if curves had been shown of the degree of transmission given by this system and also by that of the General Electric Company. In referring to this latter circuit the author refers to the high voltage—40 volts—as if it were an exclusive part of this system, whereas of course an even higher pressure is under certain circumstances used on the W. E. system, we believe there is no reason why it should not also be used with the B. I. circuits. We are sorry to see in Fig. 4 that one of the supervisory lamps is called a clearing lamp!

Another article is on "The Glasgow Trunk Exchange New Equipment," and describes the new arrangements, and there follows one by J. LEE on "The Zones and the Trunk Lines." This is not very easy to follow unless one has already some knowledge of the department's method of working the trunks.

The author's references to the deficiencies of the multiple for local systems and to the efficiency of trunks in groups leave something to be desired. An expression is used which we find irresistible; the author indicates a desire to reach Nirvana in trunk telephony. We, of the National Telephone Company, are not hoping to arrive at a state of absolute passionless calm in which the world and its toils can be contemplated without concern, and the attainment in consequence "of self-centred composure of being" (these are definitions of Nirvana in two dictionaries consulted), but this admission suggests that after all there may be some truth in the public's conception of a proper departmental attitude.

A short article is contributed by J. S. ELSTON on "Wireless Telephony between Anglesea and the Skerries," and there is a reprint from the *American Telephone Journal* describing C. D. ENOCH'S common battery receiver; but we would remind our readers that no tests have yet been published of this receiver.

We heartily commend the *Post Office Journal* to our readers, and we are sure they will do wisely to read it regularly. Already there is a list of nearly 250 subscribers among the Company's staff, and we are glad to repeat the notice of last month, that the price is 1*s.* 3*d.* per copy, or 4*s.* per annum post free, and that orders should be sent to G. BUSH, room No. 31, Telephone House.

RECOLLECTED.

BY A. C. G.

FEW men get through life without gleaning reminiscences both grave and gay, and the telephone man has unique opportunities of rivalling Autolycus as a snapper-up of trifles.

A well-known West End commission agent, long since across the Styx, interrupted some trivial telephone repairs by demanding "Where is Madagascar?" The telephone expert proved equal to the occasion, his reply seemingly deciding a bet against the interrogator. Possibly because of its rarity, this disconcerted the man of odds but little, and he hung around expressing great interest in the internal organs of a telephone. "Wonderful machine!" said he, "who invented it—EDISON?"

Now there was a telephone handbook even in those days, and the youthful inspector discoursed learnedly of HUGHES and GRAHAM BELL. But the gatherer of other folk's shekels had faith in his EDISON.

"Do you mean to say he did not invent the telephone?"

"That is so."

"By ——! He must have."

The superior person, like the poor, is always with us, and one of the most superior of the breed, having ordered a telephone for his smoke-room, requested a visit from the manager to discuss

details. With some persuading he condescended to receive a lesser official, and things went smoothly until the question of wiring arose.

"More wire!" he commented icily. "My dear" (his wife entered at this point), "I am particularly annoyed. As you well know, this house is replete with all kind of wires—telephone wires, bell wires, light wires—and just because I desire another telephone in my study, these wretched people want to put up *more* wire."

The compiler of a register of subscribers' names, believing in brevity, had in respect of an exalted telephone renter written P. o. Wales, Marlborough House. At a later date, addressing envelopes to accommodate a general circular, the eternal office boy improved somewhat upon this entry, and a chance looker-on as the circulars were being stamped opportunely withdrew one endorsed, P.O. Wales, Esq., Marlborough House.

But there are recollections making for tears rather than smiles, and who could do adequate justice to the telling of the following:—

A strong man, suddenly stricken down in the prime of life by a mortal disease, lay at the point of death within a house some stone-throw distant from that of his bedridden mother. Sharers in a strong natural affection, both were intensely grieved at the thought of parting without one last good-bye. To one member of the household came inspiration. A telephone. The end was a matter of but a few short hours, but ere it came a telephone stood by either bed, and two copper connecting threads formed the connecting link between them.

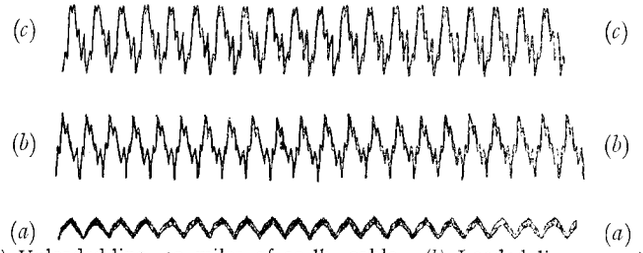
THE EFFECTS OF LEAKANCE AND THE USE OF HEAVISIDE'S DISTORTIONLESS CONDITION IN TELEPHONE TRANSMISSION.*

By B. S. COHEN.

IT has often been stated lately that an increase in leakance would to a very considerable extent improve the transmission qualities of a telephone line. The theory of this improvement is based on the fact that with the right relationship of leakance to the other factors in the line, the attenuation over a considerable range of frequency is the same and the circuit approaches, therefore, a "distortionless" one. So far this is quite satisfactory.

If, however, the practical application of leakance is considered, it will be found that with the dimensions of the factors for the general run of commercial telephone lines, any increase in leakance sufficient to give the distortionless condition is accompanied by such an increase in attenuation as to render the line unworkable in the great majority of cases. I may, perhaps, refer here to some examples given in the reply to the discussion on a paper on "Telephone Transmission Measurements" read before the Institute of Electrical Engineers by Mr. SHEPHERD and myself last year.

To obtain the distortionless condition on an ordinary 20-lb. conductor cable line requires a decrease of insulation resistance down to 200 ohms per mile loop, and the attenuation is increased six-fold. The improvement in articulation is quite overbalanced by the increase in attenuation, and the net audibility of the line is, consequently, diminished.



(*a*) Unloaded line, 20 miles of 20-lb. cable. (*b*) Loaded line, 20 miles of 20-lb. cable, with iron core loading coil giving 0·16 henry per mile. (*c*) Absolute distortionless circuit.

NOTE.—A complex musical note was used sounding into a transmitter, and the slight variation between (*b*) and (*c*) was due to variation in the quality of the note and also probably to small transmitter changes and not to the lines.

The same thing, of course, applies even more strongly to 10-lb. conductor cables. When, however, open wire circuits of fairly heavy gauge are considered, the distortionless point is reached with a much higher insulation resistance. For example, with 400-lb. open wire, 80,000 ohms insulation resistance per mile gives no distortion, and the attenuation increase is only 1·9 times. But even on this type of line it is very doubtful whether the improvement in articulation, when set off against 90 per cent. decrease in volume, would result in an improvement in the audibility. On the other hand, when loaded lines are in question the leakance must be kept quite small.

In Dr. DRYSDALE's interesting series of papers on the theory of alternating current transmission in cables (Part III), p. 469, of the *Electrician*, Jan. 10, 1908, he shows that when inductance is inserted in a line the circuit is distortionless when $KR - LS = 0$, where K, R, L and S are capacity, resistance, inductance and leakance respectively. This shows that the smaller S becomes the larger must L be to maintain the distortionless condition. Dr. DRYSDALE goes on to say that "this (the small leakance) must not be carried too far, however, as if the leakage is too small it will be impossible to obtain sufficient inductance without using large inductance coils of considerable resistance which will increase R and thus discount the advantage gained."

Now, there are two points in the portion of Dr. DRYSDALE's paper quoted to which the telephone engineer will take exception. The first is the consideration of the distortionless condition without any reference to the volume attenuation.

HEAVISIDE'S theoretically distortionless condition has very little bearing on the practical problem, and it must not be forgotten that many arrangements of factors which will give this condition may be quite impossible in practice. As a matter of fact, quite a considerable deviation is not only permissible, but desirable.

Consider formula No. 24 given by Dr. DRYSDALE—viz.:

$$2p^2 = \sqrt{(RG + xB)^2 + (RB - xC)^2} + RG - xB$$

This reduces when the inductance is comparatively large and the leakance small to the following formula in which the generally accepted nomenclature is adopted:—

$$a = \frac{R}{2}\sqrt{\frac{K}{L}}\left(1 + \frac{SL}{KR}\right)$$

where *a* is the attenuation constant and R, K, L and S are resistance, capacity, inductance and leakance respectively.

This formula, which of course indicates a distortionless condition, is sufficiently true from values of L as small as 0·05 henry per mile upwards, and when S is negligible, and in consequence a close approximation to the distortionless condition can readily be obtained in practice for all inductances between the practical loading limits of from 0·05 henry up to about 0·4 henry per mile on lines of negligible leakance.

It will also be interesting to note that this approximation directly opposes the conclusion derived by Dr. DRYSDALE from the formula of the absolute distortionless condition—viz., $KR - LS = 0$, as the leakance S may be increased up to infinity for any given value of L, thus reducing the attenuation without affecting the distortion.

It may interest Dr. DRYSDALE and others to know that careful articulation tests have been made on lines loaded in the manner described in the previous paragraph, and it has been found impossible to detect the difference between such lines and a theoretically perfect distortionless line. The accompanying oscillograms show a complex telephone wave at the receiving end of (*a*) 20 miles of unloaded 20-lb. cable, (*b*) 20 miles of 20-lb. cable loaded with iron core inductance coils, (*c*) an absolutely distortionless circuit reducing the waves to about the same amplitude as in case (*b*). The similarity between (*b*) and (*c*) is most marked. The second point to which exception must be taken in the portion quoted of Dr. DRYSDALE's paper is the statement that it will be impossible to obtain sufficient inductance without large inductance coils of considerable resistance which will discount the advantages gained by increasing the effective resistance.

Too much emphasis cannot be laid on the fact that lines are now commercially loaded with iron core loading coils, such loading coils being constructed to give inductances up to about 0·4 henry per mile, and at the same time their effective resistance is so small that the losses due to this are negligible. (These coils have a maximum time constant at speech frequencies of 0·022.)

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In conclusion, then, telephone engineers must not be led to imagine that low insulation on telephone lines may, so far from being a disadvantage, even prove beneficial from a transmission point of view. So far from this being the case, it is essential that all lines, whether cable or open wire, loaded or unloaded, should be kept at the highest practical insulation point consistent with due economy.

Also a consideration of the theoretically distortionless condition on telephone lines will probably lead to an impracticable point of view.

The formula taken from G. A. CAMPBELL'S paper, and given in a preceding paragraph of this note, enables the most suitable method of obtaining a practical approximation to the distortionless condition with at the same time the minimum attenuation to be studied.

THE SERVICE FROM AN OPERATOR'S POINT OF VIEW.*

BY MARGARET SWEENEY, *Swansea Central Exchange.*

AN operator's life while at the switchboard is, you will agree, a very busy one. With 80 to 100 subscribers of varying degrees of amiability to attend to there is enough to be done. I do not mean to say for a moment that she has all these to look after alone, for, thanks to the inventor of team work, help is given on all sides, and the work is made much easier. If proper team work is carried out, as in this exchange, one operator's load is not greater than another's. An operator's aim while at work should be to give the best attention to subscribers, and try all in her power to please them. Some subscribers, I know, are very hard to please; but at the same time if an operator does her best subscribers may soon be trained in the way they should go. She should try to make a good impression on them by letting them see, and feel, that she is trying to help them in their business in every way, such as by reducing ineffective or engaged calls, seeing calls through on the first demand, and so on. Nothing irritates subscribers more than to be told "Number engaged" or "No reply." The ineffective calls very often cannot be helped, but the "engaged" can, by tapping lines more often, and not leaving them connected after talking is finished. Again, if the Post Office operators would only clear their lines in shorter time it would be a great help. The time allowed for a trunk call is three or six minutes, but they sometimes hold a line on long enough for two or three trunk calls. When this irregularity is noticed by any of our operators it would be a good plan to draw the supervisor's attention to it. You have no doubt noticed that a great many complaints received during a day arise from this one neglect, and the attention of the Post Office officials should be drawn to it. No doubt some method can be found of avoiding this delay. Another way of avoiding engaged calls would be when a subscriber rings, and asks for "Trunks," not to leave him connected for too long after the Post Office operator has answered, as it only takes a minute or two to pass a trunk call. This would also save the operator on the down line the trouble of tapping the line, and asking the subscriber to accept a Post Office call when there is no call to accept. I think a great part of our engaged calls arise from this simple cause.

An operator should also try to remember, when a subscriber becomes irritable, the instruction in the Exchange Rule Book, viz.: "*It must be remembered that a subscriber does not know what is taking place at the other end.*" Sometimes he does not know what is to be done at his own end, not to mention the operator's end! I think if some of the most troublesome subscribers could be shown over the exchange it would give them an idea of what telephone work really is. Some of them think operators do nothing else but read, sew or sleep. The operator must endeavour to be as courteous as possible. This not only helps to gain the subscriber's appreciation, but also makes her own work a pleasure. It is only adding fuel to the fire, if when an irritable subscriber rings, he is answered in a curt or unpleasant manner. It causes him to think that the operator does not care whether he is answered or not. Try and let your "Number please," "Number engaged," "No reply," and other operating expressions be as polite and courteous as possible. I think you will find that subscribers will treat you courteously in return. Again, I think if more of our calls could be seen through on the first application it would be far more satisfactory for the subscribers, as it is clearly annoying to ask a second time for the same number. This would also save a large number of extra operations for the operator. Some of you, I know, will say that we are far too busy, but I am not alluding to the busy periods of the day. It could not be done then, but, if an operator is not too busy, she should see as many calls through as possible on first application. As a monitor board has now been brought into use at this exchange, it is upon the operator working at this position that a great deal of our subscribers' good temper depends. After a subscriber has asked twice for a number, and it is engaged, he is told that he will be rung up as soon as the called subscriber is disengaged. The operator on this board should see all calls through as soon as possible, and not allow too long a time to elapse before letting the subscriber know. He will then place more confidence in the operator, and believe her when she tells him he will be rung up. An operator should also be smart in answering and clearing, but it must be remembered that a quick answer, unless accompanied by civility and courteousness, is not the whole thing in what we call a good service. Sometimes it means a lot of extra trouble, as if some subscribers are answered very quickly and do not hear the number repeated distinctly, they will ring to see if the operator has taken it correctly.

An operator should try and cultivate a cheerful voice. There is no doubt that this is a very important factor all through one's daily life. Some operators are gifted by nature with cheerful and pleasant voices, and it is a very simple matter for them to speak nicely at any time. There are others, however, who are not so lucky, and they should endeavour to acquire this habit by careful and consistent practice. They would get on far better with their colleagues, and subscribers would appreciate the consideration expressed by the operator's voice. Some subscribers do not mind the tone of the voice which answers them. Get them the number they require and they are all right. The majority, however, do; and this more particularly applies to the operators who have to take complaints from subscribers. Perhaps it would be well for us if we could speak into a gramophone, and then hear our voices reproduced. I am afraid many of us would blush with shame. Remember that a cheerful voice goes a long way towards winning both esteem and regard, whether you are a telephone operator or not.

I should like to say a few words about team work. Team work, as you know, is one of the most necessary items in the attainment of a commercially good service, but unless carried out properly is of very little use. For instance, if an operator has six indicators down at her position, by the time she has answered the sixth she has got a long answer, but in team work, where all put their shoulder to the wheel, the sixth is answered as smartly as the first. Team work thus may be termed "a boon and a blessing to man." It is certainly so to operators engaged at the switchboard, and more especially those on the flat rate position when the heavy rushes come on, which almost frighten one; our busiest subscribers, as you know, are on this board.

Another result of team work is prevention of long answers; these, you will all agree, are a great source of worry to an operator, and no doubt cause her many sleepless nights and not a few grey hairs. If proper team work is carried on a great deal of worry on this point will be saved. It has been, as you know, the means of a great improvement in our service in every way; in fact, not much could be done without it now, and it is a great pity that team work was not started long ago. We should have had an ideal service by this time, but we must remember the old proverbs, "Better late than never" and "It's never too late to mend." While team work is going on the captain of each team should try to observe very carefully any little faults she may find in the operators of her team, and let them know of them. This will, however, be of no avail if the operators do not themselves try to rectify them. You know our captains, as a rule, are senior and experienced operators, and we may rest assured they will not lead us very far astray. The team captain should also encourage her operators; for a little encouragement goes a long way towards making a team a success, and she will see how well her operators will like her for it. If her team gets a few long answers she should not be annoyed, but should try and urge

*Abridged from a paper read before the Swansea Operators' Telephone Society.

them to do better. Her team will then take a pleasure and delight in working under her. It is the operator's duty to try to do her best for her captain, and not cause her any unnecessary trouble, either by long answers or by complaints of any kind. If in any way she has to be corrected she should listen to what is said and follow out the instructions given, and in this way we should soon have an efficient and very smart staff of operators. If there are five operators in a team, and only three of these work hard, the other two doing very little work, this cannot be called proper team work, and a remedy is needed. The real meaning of team work is helping one another in order that there shall be no overloading. I am very glad to say this is always very noticeable at our exchange, and no doubt this is the reason why our observation tests have shown such a satisfactory result and why subscribers seem far more satisfied with the service they are getting. I hope this will always continue and that team work will be the one cardinal point in operating It should also apply to the staff at our outside exchanges, inasmuch as they are operators like ourselves and need quite as much help. In fact they need even more as they have not such an easy way of getting numbers as we, and I would ask all the operators—both docks and central—to give the best attention to all the outside exchanges, more especially when the exchanges ask for party line numbers on the transfer board. It would be very advisable, too, if all the main exchange operators were taken to an outside exchange to see with what different means the operators at these exchanges have to work. You might think it a very easy matter for an outlying exchange operator to ask for "Party line" when she rings; but it is not so if she has to wait any length of time, which tends to make her subscriber impatient. When she asks for a flat rate or other number she knows she can ring, but of course she has to wait until a party line can be got for her. I would therefore again ask you all to give your best attention to the outlying exchanges, and not be the cause of giving the operators unnecessary trouble—but, rather, try to be the means of making their work very much lighter. Team work should also be carried on between the supervisory staff and the operators. I mean in this way. The operator should try to learn a few things from the monitor, such as the answering of inquiries, entering complaints in register, reporting "plugged" party lines, etc., etc. Monitors should take a few wrinkles from the supervisor or clerk-in-charge, and in this way each will learn the other's work. An operator may be called upon at any time to take one of these positions, and all these little items picked up will be very useful. The operators can help the supervisory staff a great deal, too. If, for instance, the discs fall out of the sockets, as soon as they are noticed they should be reported as they are very often the means of mistakes being made. Then, if there are many party lines plugged, the operator can try them occasionally to see whether they are cleared or not. I do not mean pull them out every few minutes, as this only causes a disturbance on the party board, but now and again when you think they ought to be clear. Do you not think it would be better when we are busy and the monitor is busy at the table, if a subscriber rings and asks for a name, for us to give it him ourselves? It is a waste of time to connect subscribers to the enquiry if we know the number. If, for instance, the subscriber rings, operator answers, and subscriber says, "I want Ben Evans, please," the operator says, "Ask the supervisor the number please." He is then put through to the supervisor, who says, "Yes—who is it you want? Oh! Ben Evans. The number is 28. Ring off, and ask the operator for it, please." Subscriber then rings off and asks the operator for No. 28—not, however, without murmuring a few blessings (?) on the telephone service. You will see this is a lot of extra trouble both for the operator and subscriber, and engenders bad temper in the latter if he is in a hurry. The plan of giving the numbers ourselves might be tried for a few days to see whether it would work satisfactorily. It would mean far less trouble for the supervisor, and be more satisfactory to the subscriber. Some of you may have different views on this point,* and I hope you will not fail to discuss my paper. In conclusion, I would ask all the members of the operating staff to take a keen interest in their work, and especially in team work. With this aim in view I feel sure we shall get along very well together. Sometimes when the results with regard to the exchange team work come out, and you find you are not at the top, do not get downhearted, but say to yourselves, "I'll see that they shall not beat us next month if I can help it." With this put in practice you will soon find your service will be one of the best that has ever been given by any of the Company's exchanges. Our society in Swansea has had the pleasure of winning a grant for being the best attended operators' society, and now we must see if we cannot win the name of being the best operating staff. It will be a hard struggle I know, but there is no harm in trying. We are all well aware of the great interest manifested by the Company in general and by district, local and exchange managers, and it is only fair and just that this interest be repaid by good and genuine operating and a thoroughly efficient service.

* The Editor is always glad to have the views of operators on this and other subjects affecting the service.

WHAT THE COMPANY IS DOING.

THE National Telephone Company opened fifteen exchanges during April, making a total of 1,477 now working. They were Adare and Glanmire (Cork), Malahide (Dublin), Gisburn (Blackburn), Crediton and Braunton (Exeter), Waltham, near Grimsby (East Yorks), Penkridge (Hanley), Wheathampstead (Herts and Beds), Wadebridge, Padstow, Porthleven and St. Just (Plymouth), Bramley (Guildford) and Alton (Hants and Dorset); 2,553 new stations were added during March, bringing the total up to 454,807.

The exchange at MILNSBRIDGE is being removed to new premises. The builders' work is completed at NOTTINGHAM new premises. The opening of exchanges at East Linton and Aberlady is being proceeded with. A rural line with six stations connecting Burnsall in Wharfedale with Grassington has been completed.

Underground Work.—The PORTOBELLO section has been completed, increasing the total in the Edinburgh district to 854 miles.

Private Branch Exchange Work.—Messrs. Hawthorn Leslie & Co., Hebburn, NEWCASTLE, have given an order for a system with nine junctions and 44 stations. The total for the Newcastle district is now 88 junctions and 260 stations. A large and gradually increasing number of operators trained in the Newcastle Exchange are employed by outside firms, whilst others have sent their own operators to the Company's exchange to be trained. In LONDON, Messrs. D. H. Evans & Co. are taking a branch exchange with eight junctions and 26 stations, and Messrs. Harrods, Peak Frean, and the Great Western Railway have all taken additional stations.

Night Operating, Manchester.—On Tuesday, March 31, the night operating at the Manchester Central Exchange was transferred to the care of a female staff; the male staff which had hitherto carried on the operating being transferred to other positions. The staff was recruited specially for the purpose, none of the applicants having had any previous experience in telephone work. Over 150 applicants answered the advertisement, of whom 35 were interviewed. From these latter the final selection was made. The staff had nine weeks' training in the operating school and at the end of that time were able to take entire charge of the Central Exchange and give a thoroughly efficient night service.

Installation at the Scottish National Exhibition.—Special arrangements have been made to provide a service at the Scottish National Exhibition which is to be opened in Edinburgh on May 1. The exchange is a well-lighted room entered from the Industrial Hall, and is equipped with a floor-pattern switchboard connected to the Central Exchange by six junction lines. Contracts have been secured for 44 connections at a special measured rate (£5 for 400 calls, excess calls 8*s.* per 100) and several others are expected. Three lines have been granted to the executive, who in turn have afforded accommodation for four call boxes. Two of these will be found in the Industrial Hall, one in the Machinery Hall, and one in an annexe to Saughton Hall, which will be a prominent point in the promenade. The offices of the Edinburgh evening papers will be connected with the press box, while estimates have been got out for connecting the fire station with sundry points and for connecting by private wire the various refreshment rooms. The exchange is not intended to be an exhibit, but it will probably serve on occasions as a useful object lesson in the private branch exchange system.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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TELEPHONE ETIQUETTE.

OF the many varied features of the telephone business which combine to give it the fascinating interest it has for all engaged in it a most important one is undoubtedly the sociological element. In no other business, in no other service even, does general efficiency depend so much on the combined effort of customer and operative. In this, as in so many other phases of telephone work, there is no exact parallel, even no close similarity, in any other business or in any other service. The essentially reciprocal character of the telephone service, the interdependence of user and operative and of user and user, differentiate our service from all other services, and the difference is made more extreme by the invisibility of telephone traffic, by the high pressure at which the service is conducted, by the absence of storage capacity, and by the fact that an error involves not merely partial but complete failure of the particular transaction.

It is largely because the general public do not appreciate these peculiar features of the telephone service that there is so much misunderstanding of "the telephone question" and so much misguided agitation whenever telephone matters become subject to public discussion. Yet a few simple comparisons would show very plainly the great differences between the telephone service and the railway, postal or telegraph services. The traveller has nothing to do, having paid his fare, but to get in the train, to make himself comfortable while in it, and to get out when it stops. The writer of a letter, having addressed it legibly and correctly (which he does not always do), drops it in the post and awaits results. The sender of a telegram writes his message, dispatches it to a telegraph office and also awaits results. The train may be delayed, the letter may go astray, the telegram may be mutilated, but the customer can neither help nor hinder, and generally does not know what is happening.

With the telephone service it is entirely different. The customer not only operates the machinery himself, but he sends the message himself and receives the reply. Once having started a call he must get a complete transaction in order to be satisfied. The telephone organisation provides the plant and supplies the trained staff necessary to maintain and work it, but the user sends his own message and must himself perform the operations necessary to indicate his desire to send a message and supply correctly the necessary indications of the person to whom he wishes to send it. There are at least three persons involved in a complete telephone communication, each invisible to the others; each communication is an individual and complete transaction, although one of a stream of many thousands; and each must be completed at a speed measured in seconds. The invisibility both of the persons and of the machinery involved magnifies any friction or delay tenfold; delay is also magnified by the nervous tension which the user feels and by the fact that his attention is entirely concentrated on a single object; while an error, even a very simple one, of such a nature that it would easily be corrected without trouble, friction or noticeable delay in a service conducted under less extreme pressure, may cause the transaction to be a complete failure.

These are the reasons why fine organisation, highly trained *personnel*, super-intelligent method, and infinite attention to detail are as necessary in telephone exchange working as the most efficient apparatus obtainable, and why on the part of the user, and between user and operative and user and user, there should be constant co-operation and a certain system of phrase and method, which for want of a better term has been called "telephone etiquette." An "Independent" telephone company in America recently gained world-wide notoriety, in the English-speaking world by cutting off the "please" from the operator's answer to a call, and the suggestion has been revived in our columns. We think it a mistake, because courtesy is the essential lubricant in spoken transactions, and is most essential in telephone work where invisibility and the nervous strain of extreme pressure are sources of irritation inseparable from the nature of the service. There are sound reasons for reducing to a minimum phrases which are repeated millions of times daily, but there are even more weighty reasons for retaining words or phrases which will cause those millions of daily transactions to be accomplished with the greatest possible smoothness, accuracy and despatch. If it is desirable to shorten the operator's answer it would be preferable to eliminate "number" and reduce it to "please" simply. "Number" can be "understood," because the user calls in order to give a number; but not only is "please," if omitted, not "understood," but "number" *tout court* could, and often would be said in such a manner as to convey the very contrary impression. There are still further reasons against a mechanical reply, such as is suggested by Mr. WICKER; such a system would confuse the occasional user and on many calls daily would cause more talking and use more time than a uniform spoken reply. Moreover, we should not lose sight of the fact that the purpose of the telephone is to transmit the spoken word, and the use of the spoken word—the quickest means of communication between mind and mind—is the glory and marvel of the telephone service. Let us beware how we detract from that.

That telephone users themselves can greatly improve the

efficiency of the service by intelligent operation of the public end of the system, and by the observance of a reasonable and practical "telephone etiquette," has been said so often that the knowledge should be universal. But people daily post letters in multitudes without addresses, daily leave their belongings in public places, daily risk life and limb in all sorts of unnecessary ways. So it is not surprising that many thousands of telephone calls daily start with "Who are you?" instead of "Is that So-and-So?" or embark impetuously on a complicated message or inquiry, without any attempt to state who is the originator or to discover who is the recipient. These slapdash and unintelligent methods inevitably cause friction between user and user, and the telephone service in general unjustly gets the odium of unsatisfactory results for which the telephone organisation is in no way to blame. It is invisibility again which is the chief cause of the trouble. If telephone users would cast the idea of a machine out of their minds, and use the same courteous and common-sense practices in talking by telephone as they observe when talking to a fellow-being face to face, they would appreciably raise the efficiency of the telephone service.

THE WORK OF THE TELEPHONE SOCIETIES.

WITH the close of the winter season the time seems not inopportune for a short review of the work achieved by the telephone societies in the Company's various districts. A wide and gratifying increase of these useful associations has been quite a remarkable feature of 1907-8, and the ever-increasing space in the JOURNAL occupied by their reports cannot have escaped the notice of our readers. We could, indeed, wish that it were possible to publish each month some sort of abstract of all the papers read; but it will be seen that with over 30 societies, many of them holding two meetings a month, more than a bare record of some eight or ten lines of each of 60 papers read is a practical impossibility. We hope, however, to publish from time to time, either in full or slightly condensed, the papers of most general interest. Many of the previous season's papers have been so published, and already some of those read during the season just closed have appeared in our pages.

Another noticeable feature of the past session is the increase of operator's telephone societies. Following the example of Swansea, the Cardiff, Bristol, Birmingham and Glasgow operators have formed societies at which instructive and helpful papers dealing with traffic questions and the efficiency of operating have been read. The Glasgow society, realising the wisdom of *utile dulci*, combine a telephone society with a club, and, after the serious business of the evening, a social gathering is held, so that often some difficulty is presented to the editorial mind whether to insert their reports among columns devoted to telephone societies or those recording staff gatherings. In numerous districts where the operators have no society of their own they attend meetings of the general telephone societies when traffic problems are down for discussion, and frequently supply thoughtful papers themselves.

This is a most encouraging sign of the commendable keenness with which the operating staff carry on their work, and is an effective rejoinder to the unthinking criticism often levelled at the operators both by the Press and the public. It would be well if such critics realised how the exchange staff apply themselves to the problems which confront them in their daily work by preparing papers for these meetings, held in their own time, and by fully and freely discussing them.

The full significance of these societies is perhaps not visible at once; their beneficial scope and power for good become more and more apparent the more their nature and effect is considered. Their action is in the truest sense reciprocal. If the Company, the service, and hence the public benefit from their activities, as undoubtedly is true, they present to the staff unexampled opportunities of displaying their capabilities and bringing to light talents which might otherwise have lain hidden and dormant. The list of those who have addressed the various gatherings ranges through the staff from the highest to the very rank and file. The societies are thoroughly democratic. The General Superintendent, the Engineer-in-Chief, and other high officials at Head Office, the Superintendents and their assistants, the District and Local Managers, the Contract Managers, Chief Engineers and Clerks-in-Charge, the clerical staff of all grades, operators, and members of the line staff have all read papers; and Mr. LAWS WEBB, Professor MAGNUS MACLEAN, and Mr. J. E. KINGSBURY (of the Western Electric Company) are amongst those outside the staff who during the last two sessions have contributed their views on technical or general subjects. A glance at the pages of the JOURNAL will show that the range of the papers is varied in the extreme. From the valuable transmission studies of Mr. COHEN and others, and papers on wireless telegraphy, down to the most elementary description of the working of a telephone instrument, they cover the whole field of the telephone man or woman's activities—Development Studies, Theory and Practice of Measured Rate Tariffs, Traffic Loads, Underground and Overhead Construction, Contract Work, Bookkeeping, Card Indexing Systems, Plotting of Curves, Cable Jointing, Storekeeping, Operating, Testing, Wayleaves, Capital and Revenue Expenditure, Central Battery Working, Switchboard Equipment, Workshop Methods, and so on—the list is endless; and besides those on specific subjects there are retrospective, historical, and reminiscent papers, outlooks, forecasts, and discursive essays on the operator's point of view and the education of the man in the street.

The societies offer a field in which all who have ideas may display them; it is a field open not only to the highly trained and scientific mind, but to the many to whom suggestions may occur in relation to their daily work. We do not counsel an indiscriminate ambition in all and sundry to cut a figure at the meetings of their local society by the reading of some ill-considered paper, and court disappointment by attempting any short cuts to promotion; but we do know that inventive minds are to be found here and there in all grades of our great staff from which useful ideas and suggestions may come, and the Telephone Society offers an unique opportunity of bringing them to light. And the full and free discussion of every paper, which should always be encouraged, offers ample opportunity to all to relate profitable experiences, to make useful suggestions or to criticise wrong methods.

AMERICAN TELEGRAPH PROGRESS.

THE report of the directors of the American Telephone & Telegraph Company giving the results of the business of the "Bell" system for 1907, exhibits some remarkable figures indeed, and sets a high standard of development to be striven for by European telephone administrations. The number of exchanges worked by

the American Telephone & Telegraph and allied companies increased during the year from 4,889 to 5,108, the miles of wire from 6,007,732 to 6,946,511, and the total number of telephone stations from 3,070,660 to 3,839,000. As for the average daily and yearly traffic in calls, it becomes necessary to think of them in millions and billions.

The report records the promotion of competitive undertakings, which exaggerated stories of the fortunes made by telephone investors had made it possible to launch, to the accompaniment of pledges of low rates for service and high dividends to shareholders, and in apparent ignorance of the large part which reconstruction and maintenance pay in telephonic expenditure. Referring to the unfortunate fate of the promises and pledges of these concerns, the report says:

"It would seem, as a whole, that the gain of the public through competition based on low rates has not compensated for the loss of capital invested in these enterprises. During this period of strife and rush for development and extension, many subscribers were connected to exchange systems with little or no benefit to themselves or advantage to others, and much was done that under ordinary conditions would not have been done. The result of these conditions has been to create in the minds of the public, and of public bodies, misleading and mistaken ideas of the telephone business. It has encouraged attempts at regulation of rates and business on lines that if obligatory or persisted in would be ruinous. In controversies as to rates, the policy of our associated companies has been to make a complete and absolute showing of the conditions, cost and value of plant, cost and value of service, cost and necessity of proper maintenance, and the broad position is taken that neither our company nor the associated companies have anything to conceal or anything to apologise for. That the capitalisation of all the companies is conservative, far within justifiable limits, and in the relation between the replacement value of the properties and the capitalisation of the companies, unique. Fair rates, therefore, should be authorised or acquiesced in, for it is only by fair rates that good service to the public and permanent, healthy conditions can be created or maintained. With a full knowledge of all surrounding circumstances and conditions, it is believed that this would be fully acquiesced in by the public.

"*Fair rates* would insure high-class plant and equipment maintained at a high state of efficiency, and would provide fair wages to employees, the highest paid for similar class of employment. Both of these are necessary to good service.

"*Fair rates* should give fair return on the investment, and promise fair return on new money needed. This is necessary to maintain the interest of the existing shareholders in the proper administration of the business, as well as to provide for the continually increasing public demand."

In asking the public to acquiesce in fair rates, and in pointing out that with these together with an honest, competent and progressive management, high efficiency and satisfactory service alone are possible, the American report, we think, takes up an impregnable position. We could wish that efficiency, and efficiency first and last, were the paramount consideration with our critics on this side, rather than somewhat chimerical cheap tariffs adapted to English needs from some unadaptable foreign country. What exchange service means and the complicated contingencies on which charges are necessarily based the report very lucidly sets out as follows:—

"An exchange system is made up of circuits (each consisting of two wires) radiating from a central office, or from central offices connected by trunk lines, so arranged that each circuit can be connected directly or through trunk lines with the others. The system of radiating circuits is the most expensive part of the exchange system to build, it is least durable, therefore most expensive to maintain, calls for the largest part of the total investment, and consequently must bear the largest part of the cost of capital. The real value of a telephone exchange system depends entirely on the distribution and number of other members of the same or other communities connected with the same or connecting systems, with whom any subscriber can have prompt and satisfactory communication. Therefore the particular circuit connecting any subscriber with the exchange is what might be termed a *convenience to that particular subscriber, but a necessity to all other subscribers.*

"It is not merely the maintenance of the individual circuit connecting with the exchange that is paid for by any subscriber, *it is in a greater measure the use from time to time of the circuits, trunks and facilities which make communication possible with all other subscribers.* It is the ability to communicate with others that makes the exchange valuable; it is the use of other circuits than your own. The cost and value of the system to any subscriber do not depend so much on the number of communications as on the number and extent of other circuits and facilities necessary to give the communications desired. It is plain, therefore, that the character of the circuit connecting any subscriber with the exchange does not determine either the cost or value to that subscriber of the exchange connections.

"The many and complicated systems of charges prevailing indicate the struggles experts have had in their efforts to establish consistent and reasonable rates. As the value of the exchange to the subscriber depends upon the number of subscribers within reach, rates must be so established that the maximum number of subscribers can be obtained, so that the greatest number of those with whom communication may be wanted will be connected with the exchange. The cost of any circuit, therefore, must largely be distributed between those who may desire to communicate with the particular subscriber connected by that circuit. The cost or value cannot be exactly distributed—an approximation is reached by measured service charges, or by a classification of service between business houses and residences with a sub-classification of plant between 'direct' and 'party' line.

"It being established that the measure of value is not in the particular class of line connecting any subscriber to an exchange, but in the use of the exchange system as a whole, and that the value of any exchange depends on the area covered and the maximum number of desired individuals that can be reached, rates must be so adjusted that no rate shall bear unjustly on particular individuals or classes; that, at some rate, connection with the exchange is within reach of anyone who can add to the value, to others, of the exchange, and that as a whole the revenue will be sufficient to maintain the plant, pay fair wages, make enough return on capital and enterprise to insure good economical management and sufficient capital to meet the increasing demands of the public."

[*Drawn by* E. J. CLARKE, *Brighton.*

"Trot along, Sonny, and fetch the pole."

HIÇ ET UBIQUE.

A SUBSCRIBER at Knaresborough has posted the following bill in large letters in Scriven, a town about two miles away:—

"Arrangements have been made by which residents in Scriven and New Scriven can have free use of telephone at National Telephone Company's call office (Mr. Linden's) when requiring goods from J. P. Lawrence, ironmonger, Knaresborough."

Some subscribers are using similar notices in Harrogate, where some of the shops are closed except in the season. The bills not only form an excellent advertisement for the enterprising subscriber, but are of educational value in introducing the telephone habit to the villages.

ACCORDING to the *Sevenoaks Chronicle* considerable dissatisfaction has been caused in the town by the erection of a "telephone poll," and the "poll" is alluded to four times in the paragraph. The last "poll" in our recollection which could be described as a "telephone poll" was in the neighbouring town of Tunbridge Wells, and resulted in favour of selling the Corporation system to the Company.

THE Rev. W. N. P. BEEBE, late vicar of St. Luke's, Brighton, who has recently been appointed to the Vicarage of Whitchurch, Devonshire, wrote recently to one of the Company's officials as follows:—

"I had to select an engineer for installing water supply in my vicarage. I turned to the National Telephone Directory, turned up Plymouth, and selected at haphazard the name of Best, 519, Treville Street, and got an estimate from him, which I accepted. He has turned out a splendid man. I told him that he was indebted to the National Telephone Company for the job."

Which demonstrates the importance of being in the Telephone Directory. Also the importance of being Best.

UNCONSCIOUS HUMOUR.

MISS E. M. RALPH, the Clerk-in-Charge of the London Operating School, has placed at our disposal a collection which she keeps of some of the most astounding answers given by learners to questions put to them in class and in examination papers. These answers form an interesting monument of unconscious humour and bear a strong family resemblance to other school "howlers." They appear to fall mainly into four groups: mishearing or inability to remember strange technical words; imperfectly—very imperfectly—digested knowledge—more than usually weak grammar; and lastly, the purely naive.

Of the first group are the following:—

Q.—Which other lamp glows beside the calling signals?
A.—The pirate lamp. (Pilot lamp.)

Q.—Name the three parts of an operator's instrument?
A.—The multitude, the journal, and the receiver.

Q.—What is S.P. the code for?
A.—Syncope. (Sidcup.)

Of the second order:—

Q.—When London trunk asks for a line which is engaged what must the operator do?
A.—The operator must immediately clear the room.

Q.—How are subscribers' lines tested?
A.—By inserting an answering cord in the subscribers' line and wriggling it about.

Q.—How are cords tested?
A.—By twisting.

Q.—How does a subscriber call the exchange?
A.—He sets fire to the pilot lamp.

Q.—What will you do on receiving intermittent flash?
A.—If the subscriber is flashing for trouble the supervisor is the one to tell.

Q.—What special calls are associated with evening service?
A.—Calls for fire.

There seems to exist here some confusion between evening and quarter day.

The following combines the third and fourth groups:—

Q.—Why is courtesy a most important factor of a good service?
A.—Because it is a good mark for the operator, besides, if an operator is not courteous, she will enrage him.

Another answer to the same question:

A.—It is very necessary that an operator should be courtesy to a subscriber and then he will be more lenient, because he does not know what is going on at this end of the line.

The learner, at any rate, had laid to heart an important axiom from the Operating Instructions.

Q.—Why is it necessary to remember which exchanges are inner London and which are outer?
A.—Because you get there quicker and it costs less.
Q.—What ringing apparatus is fitted at a common battery "B" position?
A.—There are two rows of ringing keys, the black for ordinary subscribers and the red for black subscribers.

This young lady must have hailed from parts where the racial question was acute.

Q.—What do you know of fire practice?
A.—On hearing fire alarm, operators must wind instrument plug round their waist, push chair back and fall out of the exchange in pairs.

This desperate remedy staggers the imagination somewhat, until it is perceived that "fall" is an error for "file."

Another answer to a similar question was: "Wind my cords round my waist and go out of the exits the supervisor pointed out to me." This operator meant to be ubiquitous in the most literal sense of the word.

Q.—What are the chief duties of a monitor?
A.—Monitors' duties are on the whole very responsible. If an operator eats or reads at the switchboard it is the monitor's fault.

We are inclined on this showing to agree that monitor's duties are responsible.

Q.—What are the advantages of the common battery system over the magneto?
A.—At the magneto jacks are close together so operators can sit closer together, which is a great advantage.

Definitions puzzle the mind of the learner as they have puzzled many a wiser head.

Q.—What is a transmitter?
A.—The transmitter is the thing that is fixed round your neck with elastic.

Another reply:

A.—That which is borne on the breastplate.
Q.—What is an exchange?
A.—A room or place where subscribers terminate.
Q.—What is a trunk call?
A.—Hop to Paris.
Q.—Clearly distinguish between a common battery and a magneto subscriber's instrument.
A.—The difference between a common battery and a magneto subscriber's instrument is that the common battery is stood on something and the magneto telephone is fixed to the wall.

The following are good examples of ambiguous grammar:—

Q.—How are subscribers instructed as to the proper use of their instruments?
A.—An operator is supposed to speak to a subscriber if he does anything wrong in a nice sort of way.

This student requires warning against the insidious evil of "doing wrong in a nice sort of way."

Q.—What special qualities should an operator possess?
A.—Good temper, obedience, and tidiness to the supervisors all over you.

But it must be difficult to be tidy with supervisors all over you!

Asked as to the correct procedure in the case of absence through illness, a learner replied: "On the first day you must write to the clerk-in-charge. If you are too bad to do it, you must get somebody who is not, your mother or someone like that." We had always been taught there was nobody like a mother. Another learner, hopelessly mixed, replied: "If a *subscriber* is absent through illness the clerk-in-charge must be notified, and if not visited by the matron a medical certificate must be sent on the second day." Another reply: "If I were absent through illness I should write to the clerk-in-charge, if the matron had not already visited me and given me one"—leaving the kind of "one" given rather doubtful.

The Contract Departments will appreciate the following reply to the query as to what operators should do to try to give subscribers confidence in the telephone. "Do all they can to try and make subscribers believe he is so busy that he wants another line."

A learner who was being taught operating rules on the mnemonic principle (see page 150, Vol. I) exclaimed suddenly, in enthusiastic tones: "Is there a poet in the firm? I think the rhyming perfect." We are gratified by this handsome tribute. If the young lady is now a regular reader of the JOURNAL, as no doubt she is, she will be aware that there are at least half a dozen poets "in the firm."

The reply of one student to the question, What must be fitted at the switchboard besides lines? cannot be bettered. It was:

"Operators."

COMMUNICATION.

(From a Correspondent Reproduction Prohibited.)

(*Continued from page* 16.)

I have a pamphlet of 1642 being a complete history of the Postmasters from Sir William Paget in Henry VIII's reign. It contains Charles Lord Stanhope's petition against the sequestering of his office to De Quester, the king's instructions on same, and the report of committee appointed declaring De Quester obtained the appointment by fraud. On the front is the autograph of Walter Young the diarist.

Another pamphlet of 1642 in my collection is a full and clear answer to a false and scandalous paper entituled "The Humble Remonstrance of the Grievances of all His Majesty's Posts, etc." In it is mentioned that Jude was the first to carry letters in fourteen days from London to Plymouth and that Witherings will now do so in five days. It was probably written on the sequestration of office to Burlamachy.

In 1648 a decided stand was made against the Post Office monopoly, and the Common Council of the City of London in 1649 took a curious proceeding by starting a Post to Edinburgh for the relief of the poor. I had permission, and searched the records at the Guildhall, but could find no details; any one who has any knowledge of the matter would confer a favour by giving information on this interesting subject. The Post was quickly stopped by the Government upon the following report to the House by the Council of State:—

House of Commons Journal, Vol. VI, p. 385, March 21, 1649, Post Office:

"That the Common Council of London have sent an Agent to settle Postages, by their authority, on the several roads, and have employed a natural Scott into the North, who is gone into Scotland, and hath settled Postmasters (other than those for the State) on all that road.

"The pretence of the Common Council is, for another weekly conveyance of letters, for other uses, and though pressed unto it, have refused to come to the Parliament, and to have direction from them in it.

"That, besides the intrenching upon the rights of the Parliament, it will distract that course which is now settled, and by which the charge of all the Postmasters of England are taken off from the State, and another way must be thought on for payment of them, if continued, and it cannot be longer expected to be done by me. [This is as in the original.]

"This I humbly offer and present, in discharge of the trust lying on me, and the duty which may be required of me.

"*Resolved.* That the offices of Postmaster, Inland and Foreign, are, and ought to be in the sole power and disposal of the Parliament.

"*Resolved.* That it be referred to the Council of State, to consider of the state of the offices of Postmaster, and of the interests of those persons who claim any therein, and to take into consideration, how the same may be settled in the best way for the advantage and safety of the Commonwealth, and report their opinions therein to the House, and that they take order for the present management thereof in the meantime."

House of Commons Journal, Vol. VI, p. 385, March 21, 1649, Post Office:

"Mr. Scott reports from the Council of State, a paper given into the Council by Mr. Attorney-General, concerning the posts, and that it is the opinion of this Council, that, as affairs now stand, they conceive it safe and fit, that the office of Postmaster shall be in the sole power and disposal of the Parliament, in these words, viz., 'That for defraying the charges of the several Postmasters, and easing the State of it, I published that there should be a weekly conveyance of letters into all parts of the nation.

"'That, with the benefit which came by the postage of letters, I have taken off from the State the charge of all the Postmasters of England, except Dover Road, which is above seven thousand pounds by the year.

"'That the Committee of the Council of the State, for Irish affairs, have

treated with me for taking off the charge of the packet boats for Ireland, which I have consented to do, and will cost nigh six hundred pounds a year more.'"

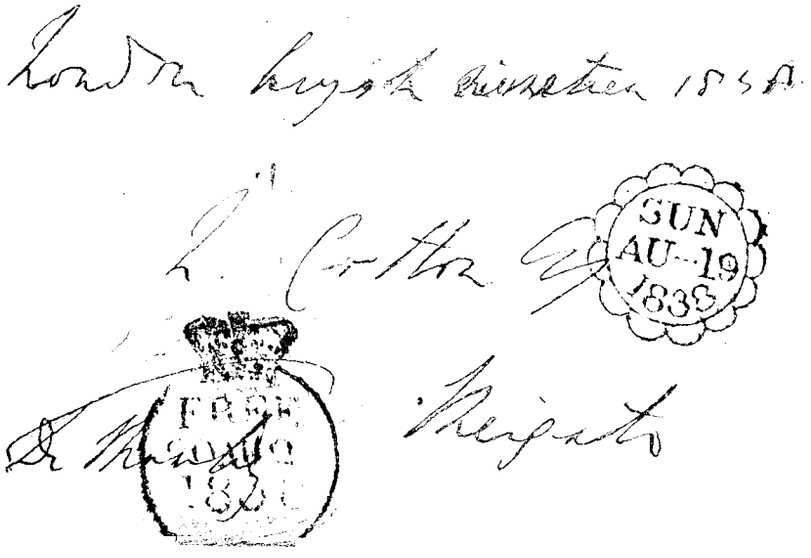
In 1660, Colonel Henry Bishop, the Postmaster, introduced the first date stamp to be struck on the outside of letters. I show one guaranteed by Mr. Daniels on a letter dated Sept. 19th, 1663.

As items of local interest, Colonel Henry Bishop was the third son of Sir Thomas Bishop, formerly a Yorkshire family. In a list of the Post Office staff of this date, I find John Rae, son of Mr. John Rae, between the Temple Gates, was the only "Letter marker and stamper" employed, so these postmarks must be rare, as they cannot be numerous.

An applicant, James Dawson, for a berth to carry letters between Leeds and Ferrybridge for the Post Office, after the Restoration, pleaded that he should receive consideration because his father's property was destroyed by Lord Fairfax at the siege of Leeds.

In 1656 an Act was passed to settle the postage of England, Scotland, and Ireland, and Sir Thomas Wroth proposed that the letters of members of Parliament should continue to pass free. I show a number of types of "Free" postmarks on envelopes franked by some eminent people.

The following was used for franked letters posted on Sunday, and is typical of the sun's rays :—



In 1839, when personal franking was abolished, Queen Victoria voluntarily surrendered her privilege with the rest. However, when settling the civil list for the present king, H.M. Edward VII, it was arranged his letters should be free of postage, and a circular hand stamp with $\frac{\text{E R}}{\text{VII}}$ surmounted by a crown is in use.

The Bill excepted the Universities of Oxford and Cambridge and the Cinque Ports. The latter were deprived of their privileges by 12 Charles II, c. 35, 1660, about which the writer would be glad to hear any details.

The duties of the ports were to supply a certain number of ships.

The Prince of Wales, who resigned the office of Lord Warden of the Cinque Ports last October, was the one hundred and fifty-third holder of the Lord Wardenship since the coast line comprising the original five ports—Sandwich, Dover, Hythe, Romney and Hastings—was made a County Palatine by William the Conqueror, by whom the first Lord Warden was appointed. The duties of the Cinque Ports were to furnish the king with ships and men, and for centuries they were the Navy's chief source of equipment. The privileges of the ports were exemption from taxation, while the Lord Warden, whose duty it was to guard the Straits of Dover and scour the ocean in search of foreign foes, drew large and mysterious emoluments for performing those offices. At the present time there are practically no important duties which the Lord Warden of the Cinque Ports has to exercise individually, except those of the chairman of the Dover Board, and his emoluments are insignificant. He can exercise, however, certain important rights of patronage. Five sovereigns of England were Lords Warden before they ascended the throne, and three royal princes have also held the office. Other noteworthy holders were William Pitt, the Duke of Wellington, Lords Dalhousie, Palmerston, Granville, Dufferin, Salisbury and Curzon, and Mr. W. H. Smith,

I have the following which throws light on the times :—

"General Post Office, 5th April, 1800.

"Sir,—We have to acknowledge the receipt of your letter of 31st March, complaining of the frequent loss of the Packets, outward and homeward bound, and appealing to us, whether some mode ought not to be adopted of placing the Communication with the West Indies upon a better footing than the present, and inclosing copy of the Instructions which you had thought it necessary to give to the Commanders in Chief of His Majesty's Forces in the West Indies, as to the transmission of certain of his dispatches by well armed running Merchant Ships, etc.

"We feel most sincerely for the political and mercantile inconveniences which must have arisen from the loss of so many Packets. But it is necessary to explain to you that the present Construction and Establishment of those Vessels was directed by the Lords Commissioners of the Treasury, after the subject had been discussed, and the present mode fully approved of by the Navy Board, which at the same time recommended to us a proper Person as Inspector of Packets.

"That Officer has reported, and it has been confirmed by the opinion of others, that no Vessels of their size and dimensions can be constructed so as to exceed them in point of sailing with the number of men to which they are limited.

"In our readiness to receive further advice upon this important branch of the public service, we have found it necessary also to take a review of many circumstances relative to the point in question. We find that during the last War, in a Period of 5 years and 8 months (taking it from the date of the Packet first captured to the time the last was taken) 24 Falmouth Packets were captured by the Enemy, and that during the present War in the period of 6 years and 7 months (upon the same datum) 31 Packets have been taken.

"The comparison (great and distressing as the loss of so many Packets must be allowed to be) is rather in favour of the present Period, if it be considered that the Enemy's Marine has scarcely had any other object this War than that of injuring the Trade of this country and capturing its Packets, many of which are at all times passing and re-passing in the line and course of the Enemy's Privateers.

"It is also an important fact, that with scarcely the exception of one instance, all the captured Packets have been taken by a force so superior that had they exceeded the present burthen, 100 tons, and been armed and manned in proportion, they could scarcely have defended themselves against it with any prospect of success.

"The additional expense of this superior tonnage and equipment will be evident, and is of considerable Argument, in a case where the result would be doubtful and where the produce of Packet Postage bears no proportion whatever to the present Expenditure.

"It is, however, our Duty to attend to such Advice and directions as His Majesty's Government may think it expedient to issue.—We have the honour to be, Sir,

"AUCKLAND,
"GOWER, } *Postmasters-General.*

"The Right Honourable Henry Dundas."

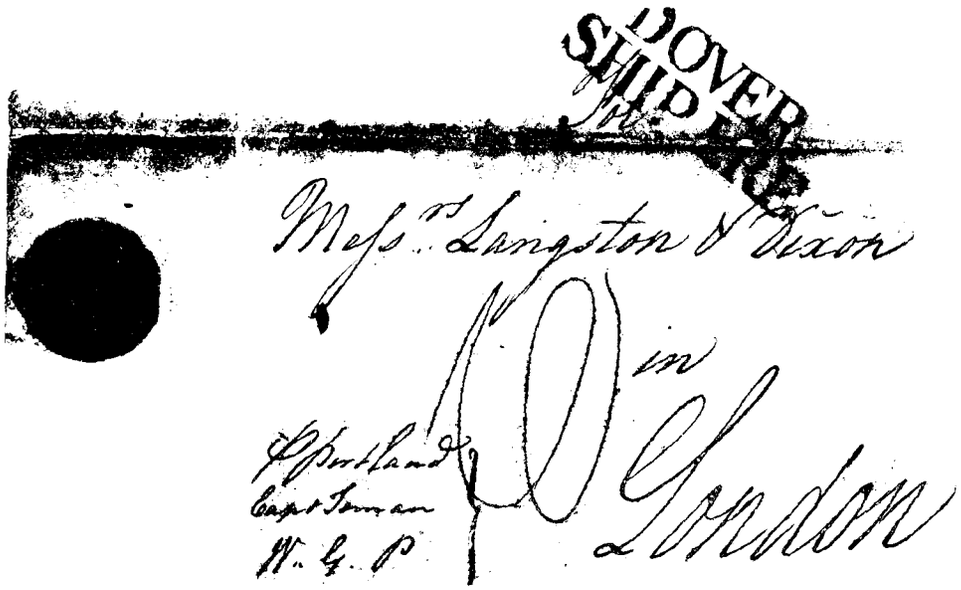
As regards Ship Letters, according to the Act of 1660, letters brought to this country by private ships were to be handed to the Postmaster, but as the captains received nothing by so doing, and were under no penalties, few letters found their way to the Post Office; the Ship Letter marks are therefore rare. The farmers of the Post Office, to secure the carrying of these letters, agreed to pay the captains 1*d.* for each one, but without much success, as other means were found to convey letters to their destination by the common carters, etc., at rates cheaper than the Post.

A better course, however, was adopted in the case of the Post of London in 1696; two officers were appointed to collect letters from all vessels, and the following notice which was issued :—

"This is to give notice that Lancellot Plumer and Williams Barret are appointed by the Postmaster-General of England to receive all such letters in pacquets from masters of ships and vessels, mariners and passengers as shall be by them hereafter brought in any ships or vessels into the Port of London, to the end the same may be delivered with speed and safety, according to their respective directions, and the laws of this Kingdom; and that all masters of ships or vessels, and all mariners and passengers may the better take notice thereof, the Right Honourable, the Lords of the Admiralty have directed that the boat employed in this service do carry colours, in which there is to be represented a man on horseback blowing a post horn."

I cannot trace when Ship Letters were first postmarked, and should be glad to have any evidence. The earliest in Hendy is apparently 1807; I have two dated 1770.

The old Ship Letter marks are very interesting, and one of them is here illustrated—



From the *Post Office Packet Service*, by A. H. Norway, I have extracted the following, which I think will be of interest:—

"No nation can afford to forget its past history, and there remains a service distinguished over and over again—an ancient service, highly useful to the Public, and associated with a great department of the State—the Post Office Packet Service, whose annals are only scantily recorded in James' *Naval History*.

"The Post Office selected Falmouth in 1688 as the port for the newly established Mail Boats to Spain.

"The Packets were hired from the Commanders, over whom was set an Agent, who, however, was not a Postmaster.

"Other writers do not seem to have appreciated the very gallant and important part the Packets played in times of war, nor would they appear to have heard of the many gallant captures made by the Packets of the Enemy's privateers.

"Perhaps the following is one of the most important services rendered by a Packet Commander:—

"The Island of Dominica was an object of continual envy of the French, lying as it did almost within sight of their own Guadeloupe. It happened in May, 1806, that although a number of fully laden sugar ships were lying in Rozeau Bay, there was no ship of war in the neighbourhood for their protection, and the garrison consisted only of a few men of the 46th and 3rd West India Regiments. H.M. Sloop *Dominica* had been sent to cruise off Guadeloupe, but her crew had mutinied, and, seizing the vessel, took her into the enemy's port, and reported the defenceless state of Dominica. Such an opportunity was not to be lost; the French replaced the traitorous crew and remanned the boat, giving her as consorts *L'Imperial*, a sloop, and two galleys. The appearance of this flotilla aroused very great and natural alarm. A glance showed that the expedition was a strong one; and, even if a landing could be prevented, it was difficult to see how the sugar ships could be saved. To slip their moorings and stand out to sea in different directions would probably be to meet destruction singly; while in harbour they were at least under protection of whatever guns could be placed in position for their defence. There was no time to unload the cargoes, and but little chance of saving them. At this crisis, and while the enemy was still some miles off the land, two English ships entered the bay. One of them was the Packet *Duke of Montrose*, commanded by Captain Bert Dyneley, the other was H.M.S. *Attentive*, which had been told off to convoy the Packet and the mails from Barbados through the archipelago of islands. The arrival of an English ship of war seemed to the Dominica merchants a providential deliverance, and under the orders of General Dalrymple, President of the Island, the *Attentive* lost no time in standing out to sea again to intercept the enemy. Her movements were watched from shore with keen anxiety, but the *Attentive* proved herself a wretched sailer. It was not the practice of the Admiralty to tell off for convoy duty any vessel which would make a good cruiser; and if the emergency had been less serious, Captain Dyneley, who must have found it difficult and irksome to keep back his own fine-sailing brig to the slower pace of the escort, might have been amused to see that the *Attentive* stood no chance whatever of intercepting the French ships, every one of which was sailing easily away from her.

"There was now no time to be lost. It was plain enough that the enemy would work havoc among the sugar ships, and might even land their troops before the *Attentive* could get into action. Only one chance of checking them remained: and General Dalrymple, backed by all the merchants of the island, appealed to Captain Dyneley to take a detachment of troops on board his Packet, and risk her in defence of the island.

"Happily for this country, its honour at this crisis was in the hands of a man whose mind was not dominated by the fear of money loss, and who, much as he might regret the risk of losing the capital on which his wife and children must depend if he fell in the coming action, dreaded far more the disgrace of seeing the Union Jack hauled down, and the tri-coloured ensign floating over Rozeau Bay. At this moment the Falmouth Captain stood for England. There was no time for reflection, and very little for preparation. Captain Dyneley cheerfully resolved to take upon himself the whole risk and responsibility of employing his Packet upon a service which, however it might result, could not be called a Post-Office service. He sent on shore all the mails which he had in charge, giving careful instructions that they were to be destroyed if in any danger of capture by the enemy. He called his crew together, explained to them what he was about to do, pointed out that they were by no means bound to follow him, and offered leave to go ashore to any man who cared to do so. Of course, not one of the Falmouth men flinched, and by the time Captain Dyneley had satisfied himself on this point, several boats full of troops had come alongside: twenty-six men of the 46th Regiment, and thirteen of the 3rd West India Regiment, were taken on board the *Duke of Montrose*, making up with her own crew a complement of rather less than 70 men; and thus provided, the Packet slipped her cable, and stood out of the bay to meet the advancing enemy. It may be conceived with what anxiety the movements of the *Duke of Montrose* were watched from shore. The flotilla of French ships was full in sight, perilously near the harbour. The *Attentive* was lying at some distance, evidently unable in the light wind which prevailed to manœuvre with any effect. Captain Dyneley's Packet was not of more tonnage than the smallest of the three sloops in the track of which she was thrown, and to the spectators on the quay it seemed that the three, acting in escort, must quickly send the *Duke of Montrose* to the bottom.

"The first encouraging fact noticed by the merchants was that the Packet sailed incomparably better than any one of her enemies, and could choose her position as she pleased. She was, moreover, very skilfully handled, availing herself of every puff of the wind, which was now growing so light as to give some uneasiness. Whether by accident or design, the French vessels had become scattered, and Captain Dyneley seized the opportunity of dealing with them separately. By far the most formidable of them was *L'Imperial*, and he therefore singled her out, and bore down on her as fast as the weather permitted."

(To be continued.)

CORRESPONDENCE.

NUMBER, PLEASE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I READ with interest the letter on "Number, please."

I fail to see where the advantage of dispensing with the little word "please" comes in.

A subscriber when calling for a number generally will say "Such and such a number, please," and I consider one courtesy is worth another.

I agree with Mr. Owen that much can be done to minimise the talking on the telephone. Your bell rings, you put your receiver to your ear, and someone whom you do not know calls out: "Who is that?" It always appears to me the one who calls up a party should first disclose his identity or his name, and then ask if the person at the other end is the required party. It is a very simple rule and shows good manners. If a stranger calls on you, does he not say who he is?—in other words, introduces himself. Why not on the telephone?

Very often a person will ring up, come out with a volley of questions, and then ring off without saying his number or name. This may be a very small thing, but as I said before, one courtesy is worth another.

Leicester. P. V. SANSOME.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE read with a good deal of interest Mr. Owen's letter under the above heading, and trust you will be able to spare a little space for the following.

The principal aim of a telephone company is to give its subscribers a smart and efficient service, and the various improvements in apparatus all conduce to that end. It is not necessary here to review all the good work done in the past, but what of the present? In this year of grace 1908 in spite of efficient and up-to date switchboards, highly trained operators, an intelligent Traffic Department, and subscribers who know everything, we are yet confronted with that oft-repeated phrase "Number, please."

It is difficult perhaps to find another expression more suitable, especially among one syllable words, on account of their apparent brusqueness; but why use a word at all? Why not substitute for the human expression a sound made by mechanical means?

After all is said and done, what value does the expression "Number, please," rapidly ejaculated and mumbled together until it can express almost any sound, convey to the subscriber? Simply this: that the operator is waiting to take his number.

My contention is that this can be effected more quickly and efficiently by mechanical means, the mere plugging in to answer the call could give the subscriber the necessary intimation, and if, as often happens now, he did not answer promptly, the pressing of a button would reiterate the signal. The signal given could be similar to the buzz from an automatic box, and could be so arranged that the operators themselves should hear it and thus know that it had been duly given.

There could be no want of courtesy in respect to this because it is purely mechanical, and subscribers learning in time that it were in vain to upbraid a "buzzer" would give more attention to the service and less to the operator, with mutual advantage to both.

Huddersfield, April 9. G. J. M. WICKER, Local Manager.

HOW I IMPROVED THE INSULATION AND LENGTHENED THE LIFE OF A VULCANISED INDIA-RUBBER LEADING-IN CABLE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

ON the most exposed side of Douglas Exchange standard I had a vulcanised india-rubber leading-in cable that had been in use some years, and the insulation had fallen so low that I had to discontinue its use. I made an examination of this cable some time ago, and found that it was good in all parts except the most exposed parts where the weather had beaten into it. I had the cable taken down, well dried, and the ragged lead ends cut off. I then re-erected the cable, *putting the inside good end outside*, and giving it a good coating of siderosthen paint. The insulation is now as good as that of a piece of new cable.

Douglas, Isle of Man, April 3, 1908. G. GILLMORE, District Manager.

POWER PLANT, COMMON BATTERY EXCHANGE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WE have been much interested in Mr. Milnes' article on "Power Plant Common Battery Exchanges," more particularly with respect to the management of the cells. In view of the general excellence of the data given, we think it desirable to correct a false impression which might be formed from Mr. Milnes' reply to "J. R. G.'s" letter, which appears in the April number of the JOURNAL. Overcharging is stated to be deleterious because "if repeated too often it leads to 'forming' of the lead framework of the positive plate under the active material causing the supports of the plate to be eaten away, and leading to disruption and consequent mechanical weakness of the plate if continued." This statement is perfectly correct when referring to the *pure Planté* plate in which the active material is formed out of the plate itself, but it is not applicable to the positive plates of the "chloride accumulator," since these are *special Planté* plates in which the frame of the plate is antimonial lead, which alloy is not acted upon during charge. We agree entirely with Mr. Milnes that excessive overcharging should be avoided, but mainly on the ground that it is wasteful and unnecessary, while very harmful under certain conditions. The extensive use of the "chloride accumulator" in telephone exchanges is our excuse for encroaching on your valuable space.

(CHLORIDE ELECTRICAL STORAGE COMPANY, LIMITED),
E. C. MCKINNON, Engineer.

Clifton Junction, near Manchester, April 2, 1908.

[Many thanks to Mr. McKinnon for his kind remarks *re* my paper. In the chloride plate I believe I am correct in saying that persistent overcharging, though not attacking the framework of the positive plate, itself causes the active material to become spongy and "grow," as stated in my reply to "J. R. G." If continued to a large extent the peroxide will blow out. It is a fact that the chloride plate will stand overcharging far longer than the average plate.—J. R. M.]

MEASURED RATES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE lucid explanation of the measured rate given by the General Superintendent at the telephone society's meeting on April 5 will, I am sure, be of great assistance to contract officers present in their task of inducing the most hardened flat rate subscriber to convert to the measured rate when it becomes an established rate in the Metropolitan area. Naturally the subscriber who has been paying 6*s*. 6*d*. per week for an unlimited number of calls over an area of 640 square miles will feel it somewhat of a hardship to be brought into line with the new measured rate users; but the case properly put by the skilful contract officer must convince him that it is equitable and just, and in the levelling it is "on all fours" with two schemes lately put forward—one affecting the whole country and the other the Metropolitan water consumers. I refer in the first case to the income tax and in the second to the Metropolitan Water Board's revision of charges. The latter has come to the conclusion that the large consumer has been paying too little for his water and the small consumer has been paying too much. I strongly endorse the remarks made by Mr. Taylor, namely, that he hoped there would be a time limit for existing flat raters; indeed, I would go further, and say that they should be brought into line upon the measured rate coming into vogue. It was a revelation to hear the number of calls per day made by some unlimited users, especially when one reads in an article contributed by Mr. Preston in the *Post Office Electrical Engineers' Journal* (the first number of which appeared this month—welcome to our new contemporary!) that the average number of calls per line per day on their busiest exchange is 6·81, and the smallest exchange 1·8. These figures include ineffective calls. There is no doubt these low averages, compared with the Company's system, are brought about by reason that 90 per cent. of the department's subscribers are on the message rate, so I think it must be fairly assumed, as Mr. Edmunds pointed out, that the Traffic Department will be truly thankful when the end of the flat rate is in sight.

April 15, 1908. W. V. PEGDEN, Sales Manager.

CHESS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to my letter on the above subject which appeared in the January, 1907, issue of the JOURNAL and to Mr. Curling's letter appearing in last month's issue, I must admit that although on the face of it it would appear that nothing had been done, my removal to another district prevented me from carrying through my original intention.

Ten gentlemen, however, agreed to join a club if formed; and I am willing to act as secretary (*pro tem.*) for London and shall be pleased to receive the names of those prepared to attend a preliminary meeting to discuss the matter.

The scheme suggested by Mr. Curling as to yearly contests, matches by correspondence and the publishing of problems in the JOURNAL seem to me to be within the bounds of possibility, and I for one would heartily appreciate such innovations. ROBT. P. LOWE (Divisional Contract Agent).

Eastern District, 17, West India Dock Road, London, E.

LOCAL TELEPHONE SOCIETIES.

Blackburn.—The sixth meeting of the session was held on March 3, when Mr. Laws Webb delivered his paper "Publicity and Promotion" before an attendance of 106, including a number of operators from Accrington, Burnley and other centres. Afterwards a very animated discussion followed, which was participated in by Messrs. Airey, Brown, Curtis, Curran, Frost, Macdonald and Stevenson, these members asking a number of pertinent questions and ably criticising the paper. Mr. Laws Webb replied very fully on the various points. Prior to the meeting the lecturer was entertained by the committee to dinner at the "White Bull Hotel."

Leicester.—At a meeting held on Feb. 28, Mr. Leonard Price gave the second part of his lecture on "Transmission," being a continuation of last session's paper, which he briefly reviewed. The principal factors in transmission dealt with on this occasion by the lecturer were: Hysteresis, attenuation, the human element—viz., articulation—and transmitter values. Mr. Price also summarised the factors and classified them in two groups—first, the factors which absorb and dissipate energy, and second, those which tend to retard energy. The enlarged diagrams of coils, etc., and the apparatus used in making articulation tests greatly facilitated this interesting but difficult subject. Mr. Marsden occupied the chair.

Isle of Man.—The papers to be given on March 20 by J. King, Wireman, and C. P. Griffiths, Assistant Lineman, were not ready, but a very interesting paper was given by W. E. Cain, from the gang, on batteries. The District Manager introduced the lecturer, who explained very explicitly all the various actions taking place in batteries. Some very interesting experiments were shown. A good discussion followed and the lecturer was heartily thanked for his paper.

A meeting was held on April 3 when a paper was read by Mr. W. Kelly, Chief Clerk, on "How the Technical Staff can Help the Office." The District Manager introduced the lecturer and pointed out the very important part the office takes in the Company's work. The lecturer, in a very well-written and thought-out paper, explained that great care should be taken with all information given to the office, that it should be correct, as the office books and returns were compiled according to the information received from the foreman. A keen discussion followed the reading of the paper, and it was evident that many points that were not so well understood before were now made clear to many members of the technical staff.

Dublin.—A special meeting was held on March 18 for the purpose of hearing Mr. H. Laws Webb's lecture on "Publicity and Promotion," illustrated by means of the lantern, which was much appreciated and enthusiastically followed. The Superintendent for Ireland presided at the meeting and Mr. Webb answered all the points raised in a very lucid manner.

The final meeting of the present session was held in the superintendent's office on March 30, at which Mr. A. Bury, Cost Clerk, read a paper appertaining to his own particular work, which was much appreciated. Many useful points and suggestions were brought out in the paper, and in the discussion which followed, such as (1) cartage of poles, (2) holding of scrap wire for best prices, (3) floating stock of apparatus, etc., etc.

Chester.—The last meeting of the session was held on March 11. Mr. T. A. Bates, District Manager, presided over the highest attendance for the session, 21 members being present and ten visitors. The lecturer was Mr. J. B. Salmon, and his paper was entitled "Underground Construction." He dealt with: Designing of Scheme.—Division of town into areas; selection of sites for distributing poles; calculation of capacity cable to be allowed; selection of routes for main cables. Carrying out of the Work.—Excavation of trenches and manholes; laying ducts; pulling in cable; testing and dry air test. Samples of cables, split pipes, etc., were exhibited, and an interesting discussion followed.

Plymouth.—On March 10 Mr. W. E. Walton, Chief Inspector, read a paper entitled "Instrument Department," which proved interesting and instructive. The meeting was held at Goodbody's Café before a fair attendance of members. Mr. A. R. Wran, Local Manager, was in the chair, and Mr. G. Hooper, District Manager, also attended.

There was a fair attendance on March 31, when Mr. W. S. Griffiths, Assistant Engineer, read a paper entitled "Overhead Construction," in which a number of useful hints were given.

On April 14 there was a large gathering when the result of an essay competition, which had been arranged by the committee, was made known and the best papers were read by their writers. The result of the competition was as follows:—The first prize, 10*s*. 6*d*., given by Mr. Hooper, the District Manager, was secured by F. Knight, of the Instrument Department, for a very excellent paper on "Instrument Faults." The second prize, 5*s*., from the society's funds, went to R. S. Harris, also of the Instrument Department, the subject being "The Fault Department." The third prize, from the funds of the society, went to A. T. J. Williams, of the Contract Department, for a paper on "The Office Work of that Department." A special prize of 5*s*. was also given by the committee for a paper submitted by Miss M. Lane, a junior operator, which was entitled "The Telephone." Mr. Hooper was in the chair at both of the above meetings, and a hearty vote of thanks was accorded to him for the valuable support he has given the society during the past session.

Newcastle-on-Tyne.—On Jan. 17 Mr. Watts, of the Head Office engineering staff, delivered a paper on "Development Studies," illustrated by a large number of lantern slides. A well-rendered paper on typical areas with their potential development formed interesting study for the engineering and allied staff, especially as Mr. Watts dealt with the lines and traffic, the classification of property, estimating the number of possible subscribers, and why development studies were necessary, in lieu of the old system of rule of thumb. The slides exhibited were of exceptional value, especially those of the summation curves with the possible cost per line and cost of junction operating. A word of warning was given to the staff not to work on American figures and reports, as the conditions and factors were essentially different. The whole of the members of the society were present. (The delay in inserting this report is regretted.)

The fifth meeting was occupied by the reading of Mr. Webb's paper on "Publicity and Promotion," the District Manager being in the chair.

The sixth meeting of the session was held on March 19, with Mr. R. W. Jackson in the chair. There were two papers, the first of which was given by Mr. J. P. Urwin, Contract Agent, on "Measured Rate Tariffs." His remarks were principally drawn from an official memorandum on the same subject. He dealt with the general principles of measured rates together with their advantages as compared to any of the other tariffs, especially advantages to the small user. All the points in the memorandum were raised and emphasised with various arguments and reasons. The speaker also outlined the present procedure of quoting rates both to intending and old subscribers. Numerous questions were asked in respect to the actual tariffs in the district, comparisons with the other rates, message, flat and party. Comparison was also asked for as regards the Post Office system (which is particularly strong in this district), its service and number of subscribers. These various points were all suitably answered. The second paper was given by Mr. H. Dent, Wayleave Officer, on "Wayleaves." He treated the subject as follows:—Wayleave officers' duties, objections of property owners, with suitable answers to them, experiences with grantors and the best methods of obtaining interviews. The paper was instructive, interesting, and at times amusing. In answering the questions which followed Mr. Dent related a number of his experiences as well as giving adequate answers to the various queries.

Luton.—An interesting lecture entitled "The Evolution of the Telephone" was given in the "Franklin Rooms" on March 28 by Mr. Langdon-Davies. His remarks were illustrated by lantern slides, and a number of interesting relics of antiquated telephony were on view, including an original "Bell telephone" and Edison loud speaking receiver. The meeting, which was presided over by the District Manager, had by the aid of an electrophone the opportunity of listening to a musical programme rendered in another part of the town.

Nottingham Factory.—The last meeting was held on April 6, 90 present. Mr. J. W. Hambleton, of the Engineer-in-Chief's staff, gave an excellent paper on "Testing." He urged the necessity of good workmanship, and pointed out that to pass the Test Department was not the only ideal at which to aim. The need of system in testing was emphasised. By means of diagrams thrown on the screen, and by specially designed apparatus, the methods employed for various instruments were explained. A very interesting discussion followed, after which Mr. Fenton briefly thanked the members for their support during the session.

In order to encourage the workshop staff to give papers during the ensuing session, it has been resolved to give prizes value £1 11s. 6d., £1 1s., 15s. and 10s. 6d. for the best papers, to be decided by members' votes. Each member will have four votes, to be recorded at his discretion, with the restrictions that each non-attendance forfeits one vote, and that he votes only for papers he hears. It is thought by this system to maintain interest throughout the session.

Greenock.—The ninth meeting was held on April 2. The president, Mr. A. Ramsay Lamb, occupied the chair, and in his opening remarks referred to the originality of the procedure to be taken that night—the title for the evening was "The Telephone: from Contract to Service." The whole details from the *obtaining of the contract to the rendering of the service by the operator* were carefully gone into and explained in the order mentioned by the following officers:—Mr. J. E. Duncan, Contract Manager; Mr. P. Smith, jun., Contract Officer; Mr. J. Ross, Cost Clerk; Mr. J. A. Swanson, Chief Clerk; Mr. A. Wilson, Chief Inspector; Mr. C. R. Rutherglen, Engineer; Mr. G. Commiskie, Storekeeper; Mr. A. Mearns, Fitter; Mr. A. Bucklitsch, Test Clerk. Mr. G. Archibald, Senior Clerk; Mr. H. Volume, Record Clerk, and Miss Keith, Operator. The President, in summing up, gave the speakers great credit for their lectures, and remarked that the mutual information obtained could not be anything but beneficial to the members of the society. Occasion was taken to present Mr. J. McClintock, Draughtsman, with several mathematical instruments in recognition of the valuable work he had done for the society in preparing lantern slides, operating the lantern, etc.

Cardiff Operators.—The last meeting of the society was held on April 7, the president, Mr. Waite, being in the chair. There were 91 per cent. of the members present, as well as the vice-presidents. This meeting was exclusively arranged as an operators' night, at which four competitive papers were given by the following members:—Misses J. Hockey, A. M. Whittle, W. Baugh, D. C. Palmer. The subjects being respectively, first, "Automatic Box Working and Automatic Box Recording of Calls"; second, "Morning Test and Reporting Faults"; third, "Team Work from an Operators' Point of View"; fourth, Post Office Junction Working."

The president, Mr. Waite, gave a prize for the best paper, and the Exchange Manager, Mr. Marsh, gave one for the second best paper. The vice-presidents acted as adjudicators. The first prize was awarded to Miss J. Hockey, and the second prize to Miss Whittle. There was some discussion on the papers, and a very interesting evening was spent. Before closing, the president took the opportunity of congratulating the operators on the improvement brought about in the service, which in his opinion was largely due to the influence of the society meetings, as undoubtedly the operators had learned many things which had made them take more interest in their work than formerly.

Cardiff.—The seventh and last meeting was held on April 2, with Mr. J. James in the chair. A paper was read by Mr. J. D. Duncan entitled "Contract Department Working." Commencing his paper, the lecturer gave a brief retrospect of the progress of the Contract Department up to the present time. He then outlined the routine of the Contract Department generally, making special mention of the efficacy and utility of the card system. He next dealt with one of the most important features of Contract Department work, viz., the engaging and training of contract officers and explained the *modus operandi* adopted. Mr. Duncan next treated of the measured rates and proved conclusively to the meeting that this is the *only* just and equitable rate the Company could introduce. The Company's system is becoming greater every year and the facilities offered to-day are incalculably greater than what they were years ago; it therefore follows that a subscriber who joined the Company's system, say, ten years ago on the fixed rate is to-day enjoying these immensely increased facilities (and it is only fair to assume that the inward and outward calls of a subscriber increase proportionately with the Company's system) at the same figure; notwithstanding the fact that the cost of operating his exchange line alone has increased many times over, to say nothing of other increased costs. A lively and interesting discussion followed in which a number took part, and which lasted fully an hour.

Nottingham.—A paper on "Operating," illustrated by lantern slides and models, was read by Miss J. Tait, Clerk-in-Charge, assisted by Miss Barker, Supervisor, on March 13. This meeting was remarkable for the very high percentage of members present, practically every member of the operating staff putting in an appearance.

The ninth meeting was held on April 3, when a short paper was read by Mr. M. B. Oldbury on "Sub-station Equipment," the subject being illustrated by lantern slides. In view of the recent change of instruments to those of common battery type at Nottingham, a considerable number of important questions was asked and dealt with by Mr. Oldbury, who is to be congratulated on giving a most useful paper.

Brighton.—On March 25 a meeting was held at the Municipal Technical College, when Mr. F. W. Roberts lectured on "The Properties of Telephone Material," concerning principally poles, standards and wires. Dr. Draper, the Principal of the College, presided, and after the lecture a discussion ensued, Messrs. F. W. Taylor (District Manager), A. Watts (of the Engineer-in-Chief's Department), W. Goulden, B. Gifford and others taking part. Mr. H. H. Broughton, of the College electrical staff, also took part. There was a good attendance, and the lecture, which was illustrated with lantern views, proved very interesting.

Liverpool and Birkenhead.—The seventh meeting was held on March 26, Mr. A. Roberts presiding. Mr. A. Savage read a paper entitled "Relays." He dealt with their importance and stated that in almost any circuit in telephony would be found one or more of these "little imps." He dealt with the intricacies of their construction, and explained briefly the invention and origin of the term "relay," which were first brought into use on telegraph lines, and solved the problem of overcoming the high resistance, the result of increasing the length of line. He described at length the method of construction and working, the improvement that had been effected since their introduction, and the use now made of them for almost any purpose, such as "calling," "lighting," "clearing," and even for charging accumulators, and anything requiring automatic switching or cutting out. The lecturer then described at length the component parts of a relay, the materials best suited for its construction, and by means of lantern slides illustrated the various types used by the Company, and described the method adopted at Royal and other exchanges in mounting them on switchboards by means of iron frames built up to them to prevent vibration and to secure a solid foundation. He then passed on to another piece of apparatus now working in some of the Company's exchanges, viz., that for the auto-lighting of switchboards, which involves the use of relays, and referred to the saving in light and power, which is considerable after the main traffic for the day is over and the operating load is reduced to a minimum (an important item in the annual cost for light and power). The discussion following was very interesting and of an informal nature.

Coventry.—The last meeting of the South Midland society was held on April 4 and took the form of a visit to the Central Exchange at Birmingham. There were present 21 members and seven guests. Lectures dealing with the working of the system were given by Messrs. Dipple and Gray, of the Electrical Department, and Mr. R. U. Tucker, Chief Clerk. The members visited each section in turn, and had explained to them the mechanism of the several parts. A short discussion was entered into as regards the common battery board working, accumulators and registration of calls.

Portsmouth.—On Feb. 25 Mr. Collins, Chief Clerk, gave a most interesting paper on "The Works Order," and, considering the subject, he was able to occupy the evening in a very interesting and instructive manner. The subject was made extremely attractive by the lucid manner in which the evolution of the works order and its course through the different departments was explained by Mr. Collins. Series of diagrams were shown. Mr. S. J. Smith (District Manager) occupied the chair.

On April 30 Mr. Cohen gave his paper on "Transmission," dealing with the different phases of transmission and the difficulties in measuring the volume of sound, etc. It was a great pity that the lecture was not spread over a succession of evenings as only the most salient points could be touched on owing to the shortness of time. The committee hope to be able to secure the services of Mr. Cohen at some future date to continue the very interesting subject. A discussion ensued which was taken part in by Mr. S. J. Smith, Mr. Bennett and Mr. Pharo. The chair was taken by Mr. S. J. Smith (District Manager).

On April 13 Mr. Roberts, Local Manager, Brighton, gave a very interesting paper on the "Properties of Telephone Material." The lecturer had been at great pains to secure some very reliable information and data with regard to the life of poles and their carrying capacity, including the stress and strains, and some very valuable information was given with regard to staying poles and routes, the lecturer pointing out that often the carrying capacity of the pole was in many cases only a secondary consideration, and that the primary factor was the staying of the routes. A discussion took place after, in which Mr. S. J. Smith (District Manager), Mr. Crampton, Mr. Yates, and Mr. Pharo took part. The lecture was illustrated by a fine set of slides.

Wolverhampton.—A meeting was held at the Town Hall Restaurant, Wolverhampton, on March 27. A paper was read by Mr. F. H. Roberts, of the Birmingham district staff, on "Common Battery Working," which was keenly appreciated, and made specially vivid and interesting by a number of ingenious models and diagrams in detail, illustrating switchboard and instrument connections in every phase. The meeting, the last of a successful session, terminated in a social manner by songs given by Misses Arnold, Anslow, Mitchell and Robinson, and Messrs. Gould and Grosvenor.

Hull. The first annual meeting took place on April 6, when the officers were appointed for the season 1908-9. The chair was taken by Mr. J. T. Tattersall, and about 50 members of the staff were present. It was decided to hold the next season's meetings in the Shakespeare Society's room, Storey Street, if this could be obtained. Mr. C. C. Worte (the District Manager) was again elected president, the vice-presidents being Messrs. A. K. Murray, A. E. Pinnock and J. T. Tattersall. The committee elected were Messrs. J. Bates, R. E. Brumby, R. Morgan, H. K. Nicholson, W. Sanderson and A. H. Sergeant; hon. secretary, G. W. Campbell; hon. treasurer, G. R. Hill; hon. auditor, G. H. Cobby. It is to be regretted that the retiring secretary could not be induced to continue in that position, as the great success of the season now closing is mostly due to his untiring efforts.

Manchester.—On March 20 the fifth annual general meeting was held. A good attendance at the meeting delighted the committee by reason of the interest shown by the members. The secretary's report was read and adopted, and the treasurer showed a balance. The keynote all through the session has been progress. The officers for the ensuing session were elected as follows:—Past president, R. H. Claxton; hon. president, R. Shepherd; president, A. Magnall; vice-president, W. S. Wallace; hon. secretary, A. Stewart; hon. treasurer, W. Cleary; hon. librarian, H. Hyde; committee, Messrs. J. Cleary, A. Coleman, H. Davies, H. H. Escott, H. Green, A. G. Hawthorne, R. Jackson and J. Scott.

Bradford.—The monthly meeting was held on March 18 under the presidency of Mr. Stelling, the Halifax Local Manager, when Mr. Gregory, the Keighley Local Manager, gave a most interesting lecture on "A Trip through Manxland." A number of slides illustrated the speaker's address, which lent an interesting aspect to the subject. Discussions afterwards took place, and altogether a most enjoyable evening was spent.

Sheffield.—The last meeting of the session 1907-8 was held in one of the rooms of the Cutler's Hall on March 20, when Mr. H. Laws Webb gave his paper on "Publicity and Promotion." There was a very good attendance, several lady members of the society being present. The District Manager (Mr. R. C. Bennett) opened the discussion with appropriate remarks.

The annual business meeting was held on April 13. The finances of the society were in a satisfactory condition, there being a small balance in hand. Mr. R. C. Bennett (District Manager) was elected president, Messrs. J. Wrigley, W. Thyne and H. G. Rowe, vice-presidents, and Mr. A. Broomhead, secretary for the ensuing session.

London.—A meeting was held on March 30 at Salisbury House with Mr. H. Davis, vice-president, in the chair, at which a very interesting and instructive lecture on the "Theory and Practice of a Measured Rate Tariff," illustrated by lantern slides, was given to a large and appreciative audience by Mr. S. J. Goddard, the General Superintendent. In the course of his remarks, the lecturer pointed out that at the present time the new rate was only in force in the provinces, but that it was intended to extend it to London at the earliest possible date. Mr. Goddard showed diagrams setting out the various measured rate tariffs in use in the provinces, and described very clearly the application of each to the requirements of the different classes of users, and indicated how by a gradual process the subscribers commencing on the lowest tariff were induced from time to time to take larger contracts for calls, finally leading up to the private branch exchange. He particularly pointed out how exceedingly flexible the new measured rate tariff is, lending itself as it does to any modification without any disturbance of the annual fixed charges. Mr. Goddard rightly contended that this tariff was the only sound and businesslike principle upon which a telephone service could be charged, as by its means the service will not only be more extensive, but far more efficient than it can possibly be under the existing rates. On the conclusion of the lecture a keen discussion took place, the following members taking part:—Messrs. F. Gill, H. Corner, H. Laws Webb, W. Taylor, L. Harvey Lowe, J. Edmonds, W. Cohen, P. Mantle and others, and Mr. Goddard suitably and effectively replied to all the points raised.

STAFF GATHERINGS AND SPORTS.

Liverpool.—A swimming club has been inaugurated under the patronage of Messrs. G. H. Robertson, R. H. Claxton, R. Shepherd and T. A. Prout, with Mr. E. J. Hidden as president, and Messrs. A. C. Godfrey, E. S. Francis, C. S. Wolstenholme, O. G. Lee, and R. T. Ellinson as vice-presidents. The large number (over 150, including 50 ladies) who have enrolled, and the enthusiasm displayed, warrants the expectation that this new social venture of the staff will be an exceptional success, and it is hoped that at an early date it will be possible to arrange for competitions with other districts. In the meantime monthly handicaps will take place, also inter-staff squadron races, and it is intended eventually to have a polo team. The badge adopted by the club is the Company's ordinary bell sign in white on a blue costume, with the blue letters N.T.S.C. in monogram. The ladies hold their club nights on Wednesdays, the male members of the staff meeting every Monday and Thursday. The subscriptions are 1s. and 1s. 6d. respectively, and the baths are those of the Liverpool Corporation at Cornwallis Street. The secretary, Mr. R. H. Diggles, would be glad to hear from other districts in the vicinity of Liverpool who would care to arrange races, etc.

Northern Division Exchanges.—Annual Whist Drive and Social.—This was held at the Reform Club, Bootle, on April 4. About 200 members of the staff and their friends were present, and a most enjoyable evening was spent. Mrs. Roberts (wife of the Local Manager) distributed the prizes, Miss Morrison (Bootle Exchange) being amongst the fortunate eight. Mr. E. W. Rowson made a very efficient M.C. The concluding dance was a very fitting termination to the proceedings.

Royal Whist Drive.—A successful whist drive, promoted by the Royal Exchange, was held in the Edinburgh Café on March 28, 165 members and friends being present. The prize winners among the ladies were Misses E. M. Jones, Martin, E. Derham and Colbeck; among the gentlemen, Messrs. Alexander, Henderson, Colbeck and Noel Jones.

Portsmouth and Isle of Wight.—The staff held a very successful whist drive at "The Mikado Hall," Southsea, on March 19. The players sat down to 38 tables, and six prizes were competed for. Heads of various departments and members from the Isle of Wight were present. The committee, consisting of Miss Yeates, Mr. Denham, Mr. Coulsell, Mr. Hamilton and Mr. Short, carried out their duties in a very creditable manner. The District Manager and Mrs. S. J. Smith were present and presented the prizes. One notable feature of the evening was that the committee of the Corporation Tramways arranged special cars for the use of the guests from outlying districts, which was a great boon.

On Saturday, March 28, the Portsmouth and district staff held their annual dinner at "The Richmond Hotel." A company mustering close on 100 was presided over by the District Manager (Mr. S. J. Smith), and included members of the staff from Southampton and the Isle of Wight. In addition to the usual loyal toasts, those of "The Company," "The Visitors" and "The Chairman" were proposed. The following members of the staff contributed to the excellent musical programme which followed the dinner:—Messrs. Pharo, Walker, F. Newton-Albany, Legge, Yates, Watson, Laird, Welch, Shannahan and Traviss. Mr. Thomas Hunter, presiding at the piano, made a most effective accompanist.

Cardiff.—The annual dinner of the district staff was held on April 4 at Barry's Hotel, Cardiff, when a representative company sat down to an excellent repast. Mr. B. Waite (District Manager) presided. After the usual toasts had been duly honoured, a splendid programme was gone through. Items were ably rendered by the following gentlemen:—Messrs. H. F. Brown, G. Bateman, W. Richards, W. Fargusson, Tony Lucas and R. Mayberry, D. Driscoll and C. Hooper.

Chester.—The staff held a whist drive on Feb. 25. The prizes were provided by the District Manager, Mr. T. A. Bates, and were kindly presented by Mrs. Bates. A very pleasing evening was spent.

Leeds.—The Mid Yorks district staff had a very successful smoking concert on March 20 at the Victoria Hotel, Leeds. There was more than sufficient talent of excellent quality than was necessary to fill the time, and the chairman was therefore reluctantly compelled to adhere absolutely to the programme, as there was no time to allow encores. The staff were delighted to welcome the Assistant Superintendent and District Manager. Mr. Crowther took the chair, and all present spent a thoroughly enjoyable evening.

Dover.—On Saturday, March 21, a football match was played at Dover between teams from the East Kent and West Kent districts. The weather was ideal for football. After a very keenly contested game the West Kent team was victorious by three goals to one. Subsequently the visitors were entertained at a meat tea, and, needless to say, ample justice was done to this. After a short musical programme the visitors took their departure being given a "rousing" send off. A return match is being looked forward to with interest.

Belfast.—A social meeting of the staff was held in Ye Old Castle Restaurant on March 11, and the opportunity was taken to present Mr. Sydney McDougall (Assistant Chief Inspector) with a handsome marble clock, on the occasion of his marriage. Mr. Gilmour (District Manager) in a few well-chosen words, made the presentation, and Mr. McDougall suitably replied, after which singing and dancing were indulged in to a late hour.

Bradford.—On April 9 at the Bradford City Fire Brigade Station a billiard match took place between the members of the Bradford City Fire Brigade and a team representing the employees of the Bradford staff. The result was a victory for the Fire Brigade by 645 to 580.

Brighton.—On Saturday, April 11, a football match took place at the Hove Police Football Ground between the local Brighton team and a team from Salisbury House. From 35 to 40 Londoners journeyed south, either to take part as players or spectators, including Messrs. Harvey Lowe, Stirling, Davis, Corner, Pegden, Phillips, Tattersall and Cherry. Mr. F. W. Taylor, District Manager, Sussex, and Messrs. C. F. Moorhouse and F. W. Roberts were among those present representing the local staff. The match proved a good one, resulting in a win for the home team by three goals to one. Subsequently tea was taken at Chatfield's Hotel and followed by a smoking concert, at which the Sussex District Manager, Mr. F. W. Taylor, presided. During the proceedings the football cup was presented to the victors of the afternoon. It will be remembered that this cup was won by Salisbury House from Brighton in December, 1906, and although it is of no intrinsic value, it will probably infuse a somewhat similar feeling to that inspired by the celebrated "ashes." It was found, too, that the visitors, since they had won the cup, had provided it with an elegant Chippendale cabinet, materially increasing its value.

Birmingham.—*Operators' Telephone Society.*—A successful session was terminated by a whist drive, concert and dance on April 11, about 170 of the staff and friends being present. The programme opened with a whist drive. The

prizes were keenly competed for, and were won by Misses H. Crowther, N. E. Poole and H. Lewis, and Mr. Lane. Refreshments were served, and then followed musical items, songs being excellently rendered by Misses E. M. Farmer, E. Harrison, J. Wescott, and Messrs. S. Lambert, A. S. Fowler and W. Saunders. Dancing commenced immediately after the concert, and continued till 11.30 p.m. The president of the society, Mr. Piggott proposed a vote of thanks to Messrs. Allen and Crecraft, M.C.'s, and to the committee for the excellence of the arrangements.

Swansea.—To mark the close of a most successful session, a smoking concert took place at the Adelphi Hotel, Wind Street, on March 20, and a gathering of about 100 of the staff spent a most enjoyable evening. An excellent programme had been arranged by the committee, Messrs. Bevan, Kenworthy, McArthur and Radford, the items of which were contributed by Messrs. Tagholm, Kenworthy, McArthur, Thomas, Pond, Howells, Freshwater and Bristow. The singing and reciting of Masters Hellings and Lewis also elicited well-deserved applause. During the evening a specially pleasing item was the presentation to Mr. W. E. Gauntlett (District Manager), president of the society, of a case of pipes and a silver cigar case, subscribed for by members of the society in appreciation of the great interest which he has taken in the meetings of the past session. Mr. R. Williamson (Local Manager) made the presentation on behalf of the members.

Nottingham Factory.—*Football Club.*—Mr. H. Wilcockson (hon. secretary of this club) has been selected to captain the Rest of League *versus* the Champion Team (Amateur League). This honour is fully deserved, Mr. Wilcockson being by far the most consistent player and goal scorer of the N.F.F.C.

Edinburgh —The district staff held a social evening in Glendinning's Rooms, Leith, on March 13. A whist tournament was engaged in by sixteen couples, the winners being Miss S. F. Wright and Mr. R. B. Rae, to whom Mrs. J. D. W. Stewart presented the prizes. An excellent programme, which included a grand march, parlour games, dancing, singing, etc., then provided entertainment for everyone. Mr. A. McNab was an energetic and successful M.C. and received much praise for the clever design of the programmes. Satisfaction was expressed that at the first gathering of the kind such a large and representative number of the staff was present.

The *Ampère Golf Club* held its first meeting for the season on April 6, when office bearers were elected. The following competitions are to take place this summer:—The Stewart medal competition to take place in May or June; an 18-hole foursome, hole and hole; 18-hole bogey competition; and, if possible, a foursome stroke competition. It was also left to the committee to arrange a match between the office staff and the electrical staff.

Glasgow.—The staff held a "smoker" on the evening of April 8 in the Royal Restaurant. Mr. Valentine presided, and during the evening made a few interesting remarks as to the negotiations being conducted by the Staff Transfer Association. A capital programme of vocal and instrumental music was submitted.

London.—The traffic staff of the *Bank Exchange* held their first progressive whist party on April 28 last. A most enjoyable evening was spent by those present, and the prizes (some of which were given by Miss Ralph and Mr. J. F. Edmonds) were presented by the Traffic Manager. The party was held in aid of the Staff Benevolent Society and resulted in the sum of £2 2s. being handed over to the society's secretary. The committee also have pleasure in announcing their second whist drive to be held at "Ye Mecca Cafe," 56 Ludgate Hill, E.C., on Tuesday evening, May 5, 1908, in aid of the Lifeboat Saturday Fund.

Clay Challenge Cup: City v. Head Office.—The final tie was played on March 21 between these sides, and resulted in a narrow victory for the City district by 1 goal to *nil*. The teams were City: Dennis, Binns, Bass, Foulson, Hemmingsley, Jones, Cowell, Foster, Sell, Leverett and Robinson. *Head Office:* H. O. T. Hanson, Heslop, Woodford, Hickey, Hemborough, Thirkettle, Hale, S. J. Bees, Phillips, H. C. Bees and Gilbert.

Gerrard Social Evening.—This was held at the Cavendish Rooms, Mortimer Street, W., on April 6, where a very enjoyable evening was spent by those present, which included members of the Gerrard traffic staff and their friends. There were also several of the various departments represented, and in all 190 were present. An excellent musical programme was arranged, and dancing was carried on from 7.30 p.m. to 11.30 p.m., the duties of M.C. being admirably carried out by Mr. E. How and Mr. C. Knapman, who were assisted by Mr. C. F. Arrowsmith and Mr. E. P. Coombe, who acted as stewards. Among those present were Mr. L. H. Lowe (Assistant Metropolitan Superintendent), Mr. J. Stirling (Chief Accountant), and Mr. J. F. Edmonds (Traffic Manager), who on behalf of the visitors gave a short address on current matters which was very much appreciated by those of the staff present. Unfortunately, Mr. C. B. Clay and Mr. Greenham were unable to be present, owing to their being indisposed. The organisers are to be congratulated on the success which attended their efforts, as the evening proved a most enjoyable one.

Kensington Exchange Dance.—A very successful Cinderella dance, organised by the Exchange Manager and staff of Kensington Exchange, was given at Fulham Town Hall on March 28, Mr. L. Harvey Lowe, Mr. J. F. Edmonds and Mr. W. J. Gilmour being present.

NEWS OF THE STAFF.

Mr. HUGH LINDSAY, Senior Contract Officer at Edinburgh, has been promoted to be Contract Manager at Greenock.

Mr. T. BENSON, Instrument Fitter, Edinburgh, has been transferred to Bideford, Devon.

Miss JANET DRENNAN, Senior Supervisor, Argyle Exchange, Glasgow, has been promoted to be Clerk-in-Charge, Bridgeton Exchange.

Miss JEANIE LEVI, Senior Operator, Royal Exchange, Glasgow, has been promoted to be Supervisor in Argyle Exchange.

Miss F. HOPKINSON, Senior Operator, and Miss N. HOPKINSON, Junior Operator, Sheffield, left the Company's service on April 10 in order to accompany their parents to New Zealand, where they are intending to reside. Miss F. Hopkinson was presented with a gold brooch and a purse subscribed for by the operating staff.

Miss ETHEL M. CRITCHLEY, Junior Operator, Birmingham, resigned the Company's service on March 19, having served as an Operator since April 7, 1905. She was presented by the staff with a handbag.

Mr. GEORGE GRAY, Test Clerk, Edinburgh, has been transferred to Birmingham as Clerk of Works. He was entertained on leaving Edinburgh, and was presented with a portmanteau, a silver cigarette case and a cigarette holder.

Miss M. Ross, Senior Operator at Edinburgh Central Exchange, has been promoted to be Supervisor.

Mr. W. TOWLAND, Inspector-in-Charge, Hawick, has been transferred to Swindon (Bristol district). Before leaving he was presented by the Border staff with a handsome umbrella. Mr. H. G. McFarlane, District Manager, made the presentation.

Mr R. DOBSON, Senior Inspector, Galashields (Border district), has been appointed to the position of Inspector-in-Charge, Hawick.

Mr. E. MANNOCK, on resigning his position as Fee Clerk in the Dover district office, was presented with a handbag, accompanied by a note bearing the good wishes of his colleagues.

Inspector HUMPHREYS, of Brighton, has gone to Luton in a similar capacity.

Mr. FRANK STEVENS, who has held the position of Sub-Engineer at Plymouth for some time, was the recipient of a set of razors and a shaving-glass from the Plymouth staff, with whose good wishes they were sent to him at Bristol, to which centre he has been transferred.

Mr. C. BALDEY, Inspector, Brighton, has been promoted to the post of Chief Inspector, Maidstone.

Mr. W. H. MAJOR has been transferred from Lincoln local office to Nottingham district office.

Miss E. YOUNG has been promoted from Junior Operator to Senior Operator, Nottingham Central Exchange.

Mr. J. G. A. EWING, Assistant Engineer, Brighton, has been appointed to the same position at Birmingham.

Miss E. WARREN on her resignation from the Service Office, London, was presented with a handsome umbrella by her colleagues in that department.

Mr. ROGER PAYNE, of the Cashiers' Department, Salisbury House, has successfully passed the examination of St. John's Ambulance Association and is qualified to render first aid. The Hospital Saturday Fund have supplied the department with a fully-equipped ambulance box, of which Mr. Payne has been placed in charge.

London Traffic Department.—*Promotions and Transfers:*

Miss L. DEANE, Supervisor-in-Charge, Richmond, has been promoted to be Senior Supervisor-in-Charge, Kingston.

Miss M. HISCOX, Operator, Battersea, has been made Supervisor-in-Charge, Richmond.

On Miss SECKER'S promotion from Gerrard as Senior Supervisor, Bank, she was presented by the staff with a travelling bag and a handbag.

The operation which Miss F. GABB, of the Examining Matron's Office, has recently undergone at the Middlesex Hospital, for fractured knee-cap, has not been successful, and we regret it has been necessary for a second severe operation to be performed at Eastbourne, where she had gone during convalescence.

MARRIAGES.

Mr. R. S. GROSVENOR, the Walsall Local Manager, was married on Feb. 29 to Miss E. PRESTON, late Chief Operator, Walsall. They were presented by the staff with a handsome timepiece.

Miss HILDE HODGSON, Senior Operator, at the Manchester Central Exchange, resigned on March 26 to get married. Prior to her leaving, she gave a party and whist drive, and was presented, by her colleagues, with a dinner and tea service, coal vase and other gifts.

Miss M. ALLEN, Senior Operator, Sheffield, left the Company's service on April 10 on account of her approaching marriage. She was presented with a cruet and set of dessert forks subscribed for by the operating staff.

Miss F. FLANAGAN resigned her position as Operator at Broomhill Exchange, on April 10 in view of her approaching marriage.

Miss ISABELLA GREIG, Senior Operator, Edinburgh Central Exchange, has left to be married. Her friends in the Central and Leith Exchanges sent her a pretty cake basket and vinaigrette.

Miss M. COOK, Operator, Swansea Central Exchange, is resigning to be married.

Mr. J. B. SALMON was presented by the Chester and North Wales staff with a very handsome music case on the occasion of his marriage.

Miss HELEN STORY, Senior Operator, Newcastle, has resigned after eight years' service to be married. She was presented by the operating staff with a case of silver-backed brushes and comb.

Miss NELLIE COTT, Junior Operator, Birmingham, resigned the Company's service on March 19, leaving to be married. She was presented by her colleagues with a silver cake basket.

Miss ELIZA STOCKALL, Supervisor at the Central Exchange, Birmingham, resigned the Company's service on March 26 to be married. She had been with the Company since Nov. 5, 1897. She was presented by the staff with a marble clock, and was also the recipient of other presents made by individual members. She carried with her the good wishes of all members of the staff.

OBITUARY.

News is to hand of the death from fever at Toronto of Mr. J. W. MITCHELL, late Inspector, Newcastle-on-Tyne, who resigned twelve months ago to emigrate with his family to Canada.

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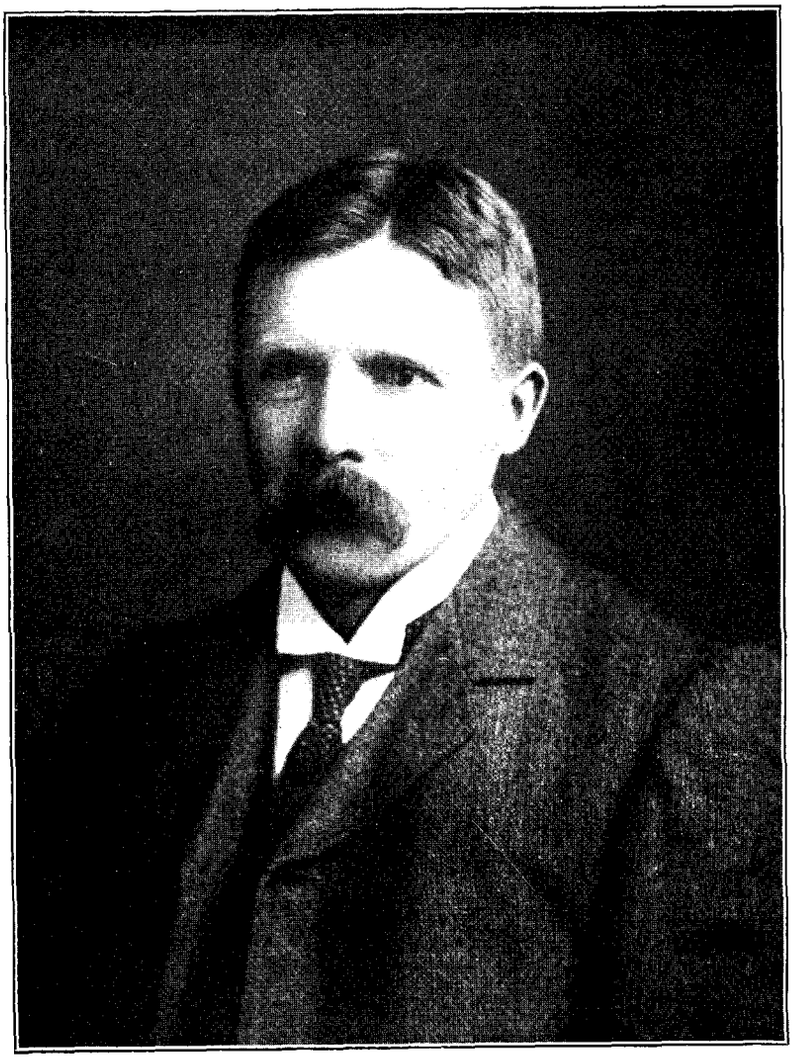
TELEPHONE MEN.

XXV.—VINCENT ALSOP.

VINCENT ALSOP is a west-countryman, having been born in Devonshire in 1868. He went to Newton Abbot College and subsequently completed his education in Germany. His connection with the law commenced when he was articled to Mr. ROBERT BAKER, late of the firm of Messrs. Baker, Watts, Alsop & Woolcoombe, of Newton Abbot. He was admitted a solicitor in 1891 and after passing six months in the chambers of a Chancery counsel—an unusual but valuable experience for a young solicitor—he was for two years managing clerk in the office of a firm in the City of London, where he had some interesting experiences in connection with the litigation which ensued upon the failure of the Liberator group.



In 1894 Mr. ALSOP joined the Solicitors' Department of the National Telephone Company, which had been formed two years previously by the late Mr. GAINE and placed under the management of Mr. SWARBRICK as Assistant Solicitor. In 1900 he was appointed an Assistant Solicitor to the Company and has had charge of most of its litigation and the organisation of the outstanding department. His legal training and tact, coupled with marked ability to appreciate all points of view, have also enabled him to render valuable assistance in the solution of difficult legal problems connected with the Company's business. Mr. ALSOP's experiences of the vagaries of that bulwark of British freedom, the system of trial by jury, have been manifold and varied. In one case the jury—it is true it was a Houndsditch jury—actually found against the Company before the case was opened, apparently deciding to their own satisfaction either that it was absolutely impossible that the Company could be in the right, or that it did not matter whether the Company were right or wrong as they were able to pay. In another, at Salisbury, where a cyclist, despite repeated warnings, had managed to get himself injured by a falling pole, the jury, in face of all the evidence, gave a verdict unfavourable to the Company. One of the jurymen frankly remarked subsequently: "Well, you see, I thought it might have been myself;" which illustrates very well the attitude of many juries towards public companies when it is a case of damages. At a coroner's inquest at which the Company were represented, their officials were impressed by the extraordinary hostility displayed by one juror who fought desperately for a rider imputing blame to the Company. After the proceedings were over Mr. ALSOP discovered that the gentleman in question was a subscriber against whom he had that morning obtained a judgment in default of appearance at the local county court. The climax was reached when on the judgment maturing some weeks later the juror appeared at Telephone House and with unabashed front demanded leniency in recognition of the assistance which he had made it a practice to render to the Company on all occasions.

On the formation of the Staff Transfer Association in 1905, Mr. ALSOP at once accepted office on the central committee, and, as evidence of the great confidence reposed in him by the staff at large it may be mentioned that at each of the three ballots for the election of the central committee he has been easily at the head of the poll. Mr. ALSOP has always taken a foremost part in the propaganda of the association, and was one of the witnesses selected by the staff to state its views before the Select Committee appointed by Parliament to consider the agreement of 1905 between the POSTMASTER-GENERAL and the Company. He has also been Vice-Chairman of the last two central committees of the association. Those who have been most closely associated with Mr. ALSOP say that, along with his modesty and desire that others should take credit wherever possible, he possesses great strength of character and tenacity of purpose underlying his tactful and unassuming manner. He is believed to number billiards and bridge among his favourite recreations.

THE STAFF TRANSFER ASSOCIATION.*

A MEETING of the newly elected central committee of the Staff Transfer Association was held on May 13, 1908, at Anderton's Hotel, Fleet Street, London, Mr. W. A. VALENTINE in the chair. Messrs. Alsop, Barnett, Bold, Bennett, Corner, Lowe, Poole, Scott, Sutcliffe, Tattersall, Watts and Williamson were all present, so that there was a full committee.

The committee confirmed the minutes of the last meeting and unanimously re-appointed Mr. Valentine (chairman), Mr. Alsop (vice-chairman), and Messrs. Bold, Lowe and Scott as the executive committee.

Mr. Leslie and Mr. Sandy were also unanimously re-appointed as honorary treasurer and honorary secretary respectively.

A vote of thanks was unanimously passed to Messrs. Barnett aad Campion for their services as auditors, and owing to Mr. Barnett being now a member of the central committee it was resolved to ask Messrs. Campion and Hare to be kind enough to act as auditors for the ensuing year.

The *resumé* of the interview between four members of the executive committee and certain of the permanent officials of the Post Office, a copy of which is given below, was read and discussed.

It was unanimously resolved "that all matters relating to the affairs of the association intended for insertion in the TELEPHONE JOURNAL shall be submitted to and be approved by the executive committee," and further "that the editing committee of the TELEPHONE JOURNAL be asked to be kind enough to insert a note at the foot of Staff Transfer Association news or articles appearing in the JOURNAL to the effect that any questions or correspondence with regard to the same must be addressed to the association's principal secretary, and not to the editor of the JOURNAL."

A number of resolutions from various local committees were discussed fully in detail and instructions given to the principal secretary as to the replies which were to be sent thereto.

Resumé of interview on Monday, April 13, 1908, between Messrs. King, Ogilvie, Norway and White, on behalf of the Postmaster-General, and Messrs. Alsop, Bold, Lowe and Scott, on behalf of the National Telephone Transfer Association.

The points contained in Mr. Alsop's letter to Sir George Kekewich of March 5, 1908, were discussed, and the following is, put shortly, the gist of the discussion on each question :—

(1) It was pointed out on behalf of the Post Office that the question of staff might not, after all, be dealt with in the Money Bill but by means of a separate Bill amending the Superannuation Acts; and that the provisions of the Bill—like those of the existing Superannuation Acts—would be of a permissive character, conferring no absolute right on individuals and leaving a discretionary power to the Treasury. Mr. King pointed out that it would be impossible to undertake to give the association's representatives inspection of the Bill before it was introduced; but after some discussion said that he would undertake to make every endeavour to arrange that the association's representatives should have an opportunity of discussing points affecting the staff which would be dealt with in any such Bill before the Bill was drafted.

(2) The staff representatives pointed out that they could not contemplate that it was in the minds of the Post Office when the question of seniority arose in connection with cases of promotion to give the preference to an official who may have been longer in the Post Office service although his general service in telephony might be shorter. It was admitted by the Post Office officials that, whereas such a course would naturally be unwelcome to the staff of the National Telephone Company it was the duty of the Postmaster-General to consider the matter also as affecting the rights of the existing Post Office staff, and they anticipated much practical difficulty if an attempt were made to deprive a man of seniority which he had won by actual service under Government. The staff representatives stated that they attached importance to the question of seniority more in regard to promotion than as regards choice of leave. Leave, as regards operators in the National Telephone service, is spread over the whole year and not confined to the better months, and is largely dependent on the requirements of the service. The Post Office officials pointed out that the officers of the Company had not a strong case for asking for seniority on classes—such as those in the Engineering Department of the Post Office—which are not entirely composed of officers performing telephone duties. In the end it was suggested and agreed that the solution of the seniority difficulty might be found by deciding questions of promotion as far as possible on merit alone, and disregarding seniority as between service with the Post Office and service with the Company. The Post Office officials pointed out, however, that it should not be supposed that a Government Department can ever disregard seniority with the same freedom as a private employer.

(3) It was agreed that all probationary periods to which new *entrants* into the Post Office are ordinarily subject would be regarded as covered by all those members of the Company's staff who had been continuously employed from a period prior to 1910.

(4) The Post Office officials stated that the question of an examination did not rest with them, but with the Civil Service Commissioners, and they could give no undertaking on the subject; they did not think however that, speaking generally, an examination would be imposed as a test on entry into the Post Office of the officers agreed to be taken over. The staff representatives stated that any attempt to call upon the Company's staff to pass an examination would be looked upon as a distinct breach of the undertaking given in Parliament and that they could not contemplate the possibility of such a course being adopted.

(5) The question of loss was discussed but no agreement was arrived at.

The utility of future meetings of a similar nature was discussed, and the Post Office officials stated that they would be pleased to discuss matters further, especially questions arising on the classification of the Company's staff, at future meetings.

On the question of establishment Mr. King stated that arrangements were now going forward towards classifying, and, where necessary, establishing the telephone staffs taken over by the Post Office from the Glasgow and Brighton Corporations and also the London Manager's clerical staff; and he agreed that the staff in the Clerical, Engineering, Traffic (Operating) and Faultfinding (that is, staff engaged upon clearing faults on instruments and in exchanges) Departments would in the main be established from the date that they entered the service of the Post Office, provided that they had served not less than two years continuously with the Company on Dec. 31, 1911. He pointed out, however, that the minor grades of officers employed by the Post Office on construction work were unestablished, and that of the minor grades of officers employed by the Post Office on maintenance work 38 per cent. were unestablished and 62 per cent. established; and that the same conditions would apply to officers of similar grades taken over from the Company. It was also pointed out that in accordance with the general Civil Service system, clerks in the Solicitor's Department of the Post Office were paid out of an allowance to the solicitor, with whom their employment rests, and that such clerks are not established officers of the Post Office. Mr. King suggested that if the staff representatives were in doubt whether any particular classes of officers in the employ of the Company would be placed on the Post Office establishment they should furnish full particulars regarding them, when the matter would be considered.

It was agreed that classification of the officers taken over would not necessarily depend on the titles of the posts held by them in the Company, but that regard would be had to the duties performed by them.

The staff representatives called the Post Office officials' attention to the fact that the staff's claim was for the benefit of their full past services in accordance with the precedents which were quoted before the Select Committee, but the matter could not be pressed or fully gone into, seeing that it was a question of principle which required to be settled by Parliament and lay outside the administrative questions the discussion of which was the real object of the interview.

* Any questions or correspondence with regard to news relating to the Staff Transfer Association must be addressed to the principal secretary of the association.

ANTWERP AND BRUSSELS TELEPHONE EXCHANGES.

By E. A. LAIDLAW, *Engineer-in-Chief's Staff.*

ON a recent visit to Belgium I took the opportunity of visiting the Antwerp and Brussels Exchanges, and I think a few remarks on what our neighbours are doing in telephone matters will be of interest to the readers of the JOURNAL.

It will be remembered that the building housing the Antwerp local and trunk exchanges was completely destroyed by fire during

FIG. 1.

the night of Oct. 28, a description of which appeared in the JOURNAL of last December. The cause of this fire, though very carefully investigated, has never been determined.

On the morning following the fire the telephone engineers of the Government and those of the Western Electric Company had a conference as to what should be done to re-establish the service,

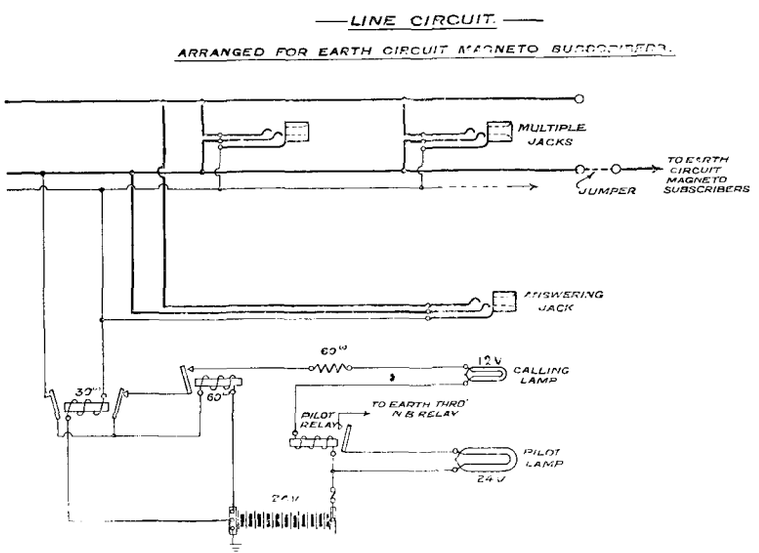


FIG. 2.

and it was decided that, as only 200 subscribers' lines out of the 4,400 were metallic circuit, the temporary exchange should be arranged for earth circuit working, also that it should be installed in the building which had been erected for a new central battery equipment situated about a mile away from the old exchange. This new equipment the contractors had fortunately well in hand, and it was decided that the connections of the new sections should be modified for magneto calling and clearing.

This modification, although it meant a considerable amount of re-wiring, was thought advisable as the apparatus used would be of the regular central battery type and would therefore come in later for extending existing central battery equipments and new exchanges.

The new telephone building had been completed for about three years, but the equipment had been postponed from time to time owing to the telephone arrangements in other towns of the country being in more urgent need of reform and therefore having a prior claim to the money which had been assigned for telephone improvements.

As the new switchroom would be required for the permanent equipment it was decided that the temporary switchboard should be erected in one of the corridors, which it will be seen from the photograph (Fig. 1) is quite wide enough for this purpose, the architects not having, it would appear, to economise floor space when designing the building. This exchange consists of twelve "A" sections and one "B" section, each arranged for three operators, also ten one-position toll sections for trunk lines and junctions to the few sub-exchanges, Antwerp being practically served by one exchange. The multiple is wired for 4,800 lines, multipled every nine panels, and the average number of lines

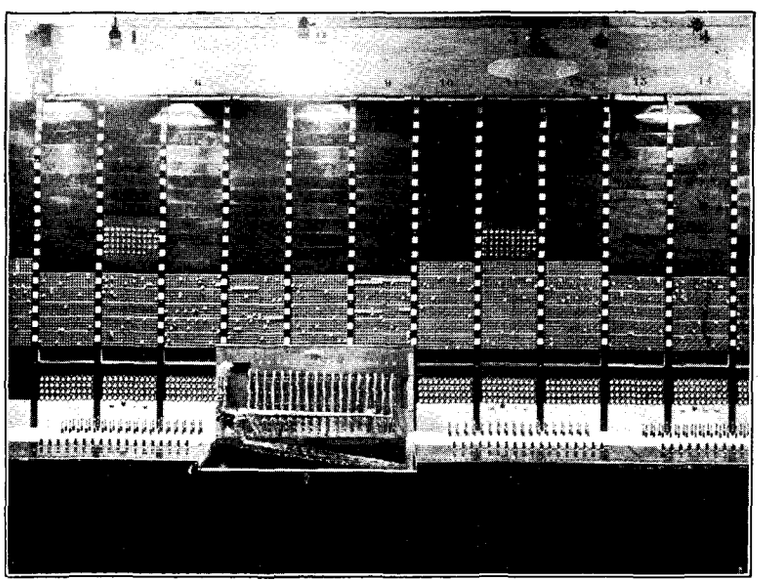


FIG. 3.

equipped per section is about 400. The circuit employed for calling is on the lines of that shown in Fig. 2, the apparatus used being of the regular central battery type.

The "A" operators' cord circuits are connected up for earth circuit working, and equipped with ring-off hand restoring indicators which are fitted as shown in the photograph (Fig. 3) above the answering jacks.

A main frame of the regular design is erected in a room adjoining the corridor, but no intermediate frame has been installed for this equipment, it being considered that this was not warranted for a temporary exchange. Beside the sections already mentioned a number of small switchboards are erected to accommodate the usual local lines from chief operators, supervisors, etc.

Fig. 4 shows a photograph of the rear of the "A" sections.

Fig. 5 the front view of the toll sections, and Fig. 6 the rear view of the toll sections.

The accumulators and machines installed for this plant will be used on the permanent equipment. Two sets of eleven cells of the Tudor type in lead-lined wood tanks are installed, each having a capacity at a ten-hour rate of 3,600 ampere hours. These cells are fitted on a continuous stand erected about 12 inches from the floor. The power board also forms part of the permanent equipment and is of the regular design with a change-over switch

for the second battery, the apparatus being mounted on marble panels. A photograph of this board is shown in Fig. 7.

Duplicate motor generators have been provided, each with an output of 600 amperes at 30 volts, for charging the accumulators. The dynamos are of the regular telephone design with the usual large number of armature windings to prevent noise on the lines from commutation during the time of charging.

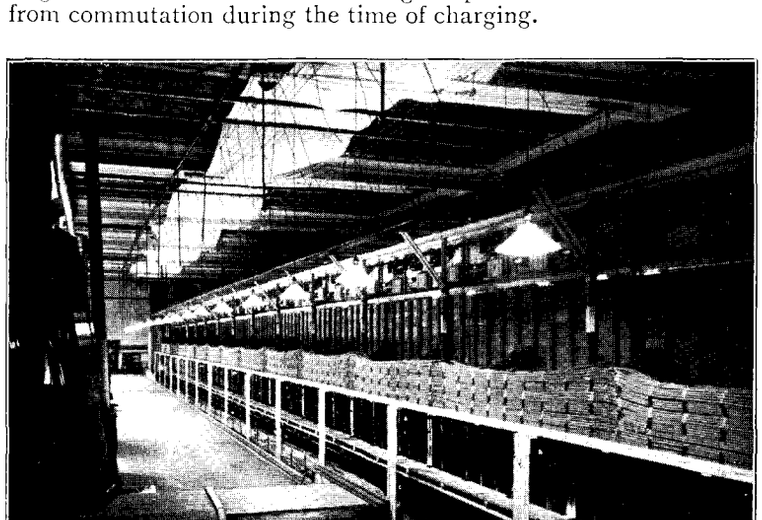


FIG. 4.

The work of installing this equipment and connecting up the subscribers' lines was started immediately after the fire, and the exchange was brought into operation on Dec. 1, 32 days after the fire. I was informed that the number of lines working on the first day of opening was about 4,100 and the remaining 300 were connected during the following week. When it is considered that to carry out this work engineers and linesmen from Germany had to be imported to get all the subscribers' lines connected and that these lines had to be carried a mile away from the original exchange,

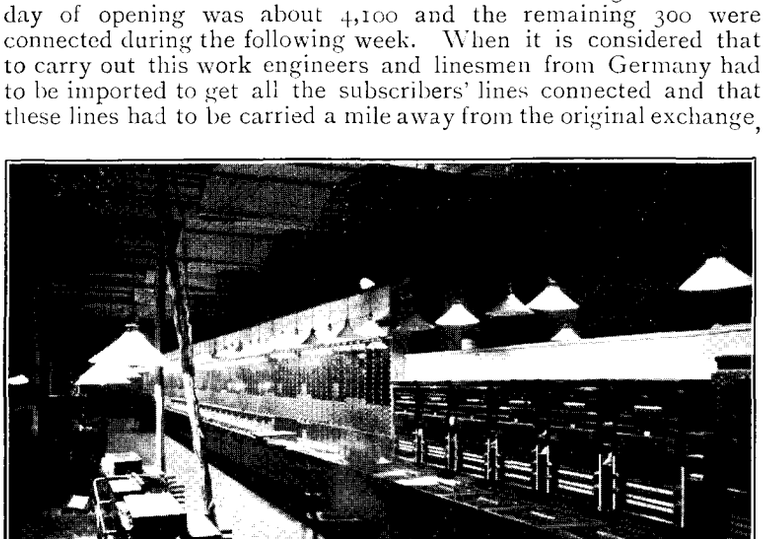


FIG. 5.

also that a switchboard had to be erected with all the apparatus pertaining to it, the telephone engineers of Belgium and those of the Western Electric Company are to be complimented on the able and prompt way the work was carried out. It will be seen by the photographs that although the work is of a temporary nature, from a telephone point of view it is good, and the service given, I was informed, on this temporary switchboard was of a much higher standard than that previously given on the old series multiple board which was burnt out.

I next visited Brussels which is also served by a single exchange, situated in a building about the centre of the city. The switchboard is of the central battery type and consists of 23 "A" sections and three "B" sections, each section being arranged for three operators. The equipment of the multiple and answering

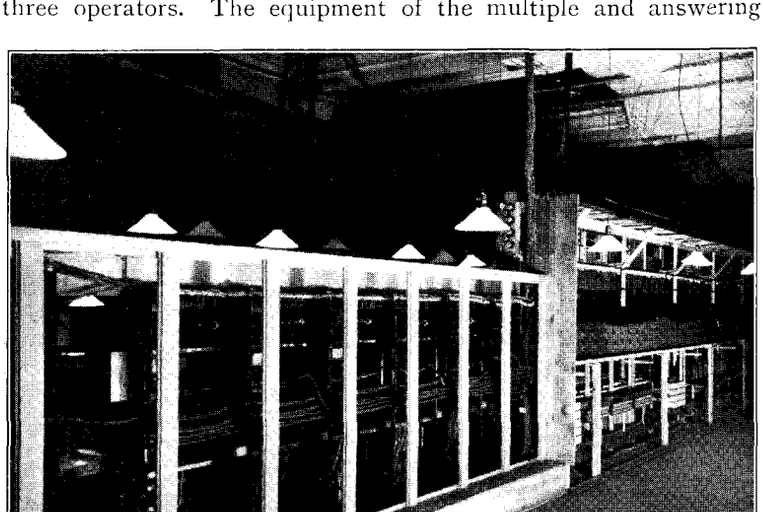


FIG. 6.

jacks is for 13,140 lines, eighteen "A" sections being equipped for 480 jacks each, and five "A" sections with 900 jacks each.

The circuits employed on this exchange are the standard central battery and need no description. The switchboard is located in a magnificent room about 148 feet long by 65 feet wide, and accommodates in addition to the above seven two-position sections for trunk lines and one two-position concentration section for bringing all lines together during slack hours. Each trunk section is equipped with eight lines. The apparatus room accommodates a frame for carrying cable heads on which all the outside cables terminate, a standard main frame fitted with arresters and

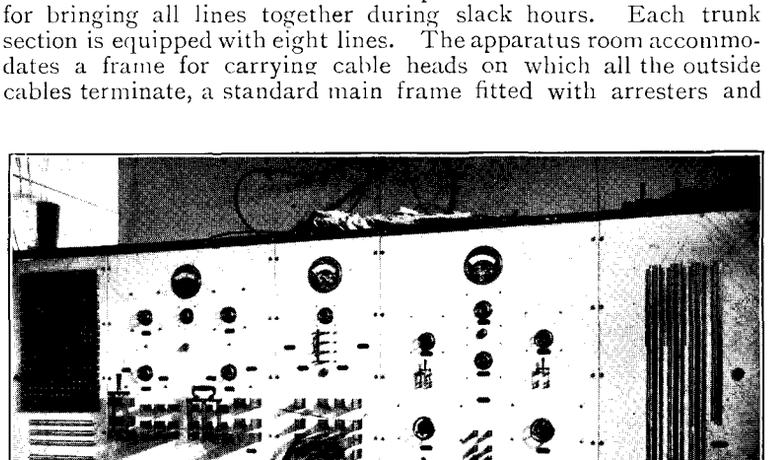


FIG. 7.

heat coils connected by switchboard cable to the cable heads, the usual intermediate frame and relay racks. The general maintenance of the whole exchange struck me as first class, there being at the time of my visit only thirteen lines plugged out for faults, and the average number of complaints received from all sources each day, I was informed, was only 60.

The staff employed for the upkeep of the exchange consists of

two test clerks, one fault clerk, two inspectors for connecting new subscribers and clearing faults on the local and trunk sections, and one man repairing cords.

The small number of complaints received and consequently the number of the staff employed in the exchange is due, I think to the fact that the outside work is in good order, the calling rate of the subscribers low, and the subscribers' installations fitted with standard central battery apparatus with very few extensions. The equipment installed in this exchange is nearly full, there being 10,082 lines working, and the administration are considering the erection of a similar size switchboard in the existing switchroom which is quite large enough to take it. I cannot say whether a study has been made to determine whether it is economical to instal two large switchboards in one building instead of erecting an exchange in another part of the city. I understood, however, that a fair number of the subscribers' lines were some distance from the exchange, and if this is so, it would appear that the cost of the copper in the cables necessitated by terminating all lines in one exchange will more than swallow up any gain, which will be derived by the reduced cost in managerial and operating charges by having the two switchboards in one room. I was unable to get any traffic data, and from the enquiries I made no study has been given to this or records taken, and also from the appearance of the cross-connections on the intermediate frame, the value of distribution of the subscribers' lines to even up the load amongst the operators is not appreciated.

Nearly all the subscribers in Belgium are on the unlimited rate basis, but I was given to understand that the question of adopting a measured rate tariff in the near future was receiving very careful consideration.

THE MAIN OBJECT OF A TELEPHONE SOCIETY.*

BY CHAS. E. FENTON, *Factory Manager.*

THE main object of the society is to improve our individual knowledge of the general principles involved in the business with which we are associated, particularly that section in which we are directly engaged. It is a worthy object, and I am glad to see that it appeals to so many. With a wider knowledge of the underlying principles we shall be able to perform our work—be it small or great—in a more efficient and capable manner, and in many members it may be the means of bringing to life hidden powers which otherwise might have remained dormant. . . .

I should like to suggest to those members who are preparing papers not to deal with their subjects in a general way, but rather to endeavour to treat and enlarge on points which are not common knowledge; and if the critics will follow the same lines, we shall be likely to accomplish some useful work. Whilst certain members have been deputed to criticise the papers, I should like it to be clearly understood that anyone may criticise or join in the discussions.

Although the papers in themselves will be instructive, it is essential, if we are to derive any real and permanent benefit from them, that we should follow up and investigate for ourselves the new train of thoughts or ideas which are opened to us. We are connected with a vast organisation, and although great strides have been made within recent years, these are small when compared with the progress which will be made during the next few years. My advice to you all is to stick to telephony, extend and improve your general knowledge of it all you possibly can, for there will be an increasing demand for really capable men in all departments. If we are to achieve success it is very necessary that we should examine ourselves as to our general habits, develop and fix the good ones, acquire and cultivate others which are classed as good, but which we do not possess, strive to reject any which are a hindrance to us, and thus prepare the foundation for our future.

I would urge all of you to be ambitious, fix in your own minds what you want to achieve—but in doing so you must aim high—determine that you will reach a higher standard, and so raise yourselves above the crowd. To do this may possibly mean self-sacrifice in many respects, but, if you will bring into operation your talents, success must follow.

Next I wish to impress upon you to be methodical. This is a vital factor in efficiency. It matters not what department you are engaged in or what operation you wish to perform, you must lay out your matter or material on a well-devised plan if you are to attain the best results. The absence of method has proved a stumbling block to many. It is possible to judge a man's capabilities by his method. I have invariably found that a man with good method is an efficient worker.

Be thorough. Many lack this good quality because they do not carefully study the work they have in hand. We must learn to concentrate our minds on all we do if we are to reach perfection. The inaccuracy of what may appear to be minor details often involves serious consequences and much unnecessary labour. Mistakes will happen, but we may profit by them if we always honestly bear in mind the lesson they should teach. Mistakes repeated become carelessness.

Be flexible. The tendency of the present day is to specialise everything; by this means no doubt much better results are secured. You who are specialists must, however, not neglect to improve your *general* knowledge. It is certainly an advantage to be able to execute one class of work to perfection, but if you are called upon to do something which you may consider to be outside your province do not hesitate to perform it cheerfully. You will gain some new experience which may even be beneficial in your own special work. Seize every opportunity which presents itself to add to your experience, you will then increase your usefulness and fit yourselves to fill higher positions.

Another point of importance is co-operation with each other in your work. In every large system such as ours, where we are dependent to some extent on one another, if we are to be an efficient body, each individual must co-operate with his fellow-workers. Just as the strength of a chain is measured by its weakest link, so is the efficiency of a system judged by its weakest part. We can strengthen the weak link of a chain, and likewise we can strengthen the weak part of a system by co-operation. Let each do his own share of the work, and should he know of any inaccuracy or omission on the part of another, let him call the attention of the other to the fault at once. It is possible that in handing work over to another department some word of guidance may be of immense value. Do not fail to give it.

Co-operation affords great scope and opportunity for men to develop many good qualities, and at the same time promote their firm's welfare.

* Abridged from an address to Nottingham Factory Telephone Society.

THE TELEPHONE MASONIC LODGE.

THE Telephone Lodge No. 3,301 was consecrated on May 8, the principal Consecrating Officer being Bro. Sir Edward Letchworth, F.S.A., Grand Secretary, who was assisted by Bros. Jas. Stephens, P.D.G.D.C., John F. Roberts, P.G.Std.Br., Rev. J. Farrington Downes, M.A., P.A.G., Marr Johnson, D.G.D.C., and Wm. Shackleton, G.Std.Br. After the ceremony Bro. F. O. Harke was installed as the first W.M., with the following officers:—P. P. Kipping, S.W.; S. J. Goddard, J.W.; C. E. Tattersall, Treasurer; Patrick Kenny, Secretary; F. A. B. Lord, S.D.; E. J. D'Authreau, J.D.; A. F. Paddon, I.G.; Rev. Watts Ditchfield, Chaplain; C. E. Wetton, D.C. The following are also founders of the lodge:—Bros. F. W. W. Holder, J. E. Pullen, W. J. Downes, W. M. France, R. H. Kenway, W. V. Morten, R. Johnston, F. E. Sims, T. Taylor, P.G.D., and F. A. S. Wormull.

After the ceremony upwards of 50 brethren including the consecrating officers dined together at the Gaiety Restaurant.

The first regular meeting of the lodge was held on May 16, when five candidates were initiated. Amongst the visitors who were present at the banquet which followed were Bros. Thos. Fletcher, P.M., C. H. Sibley, A. Pugh, W. E. Gauntlett, J. W. Wrigley, J. T. Whitelaw, A. T. M. Thomson, etc.

Many congratulations and good wishes for the prosperity of the lodge have been received from telephone masonic brethren.

Particulars can be obtained from the Secretary, 14, Greville Road, Walthamstow.

CARD INDEX OF SUBSCRIBERS.*

BY E. T. PAYNE, *Chief Clerk, Newcastle-on-Tyne.*

THE advantages of the card index system being numerous, and more especially since the introduction of the new measured rate services, I have thought it worth while to deal with our methods.

The full name of the records, according to the Service Instructions, is "Card Index Register of Subscribers." This being a lengthy description, the contractions "C.A.," "C.N." and "C.S." are used for office purposes, indicating the alphabetical, numerical and street cards respectively.

Three classes are supplied by Head Office (Street cards, Schedule 1475; Alphabetical cards, Schedule 1475A; and Numerical cards, Schedule 1475B). Each of these has exactly the same ruling, the colours alone being different. As the cards are opened in the district office for new subscribers, the ruling is altered to embody additional information. I give on diagram "B" an example of the actual cards, showing in italics the alterations we make locally.

In entering these up we give the subscriber's works order number, due date, rental folio, and one of the following prefixes:—

PREFIXES TO TELEPHONE Nos **A**

F.R.	DIRECT FLAT RATE LINE.
Y.F.	OLD FLAT RATE PARTY LINE.
P.F.	PRIVATE BRANCH EXCHANGE, UNLIMITED.
M.E.	OLD MESSAGE RATE LINE.
Y.E.	OLD MESSAGE RATE PARTY LINE.
P.L.	PRIVATE BRANCH EXCHANGE, LARGE USER.
P.S.	PRIVATE BRANCH EXCHANGE, SMALL USER.
M.D.	MEASURED RATE, DIRECT AND AUXILIARY LINES.
Y.D.	MEASURED RATE PARTY LINE.
C.O.	FREE CALL OFFICE, MESSAGE RATE LINE.
A.B.	AUTOMATIC BOX— NON-RENTAL— MESSAGE RATE.

We also include subscriber's pass number, if any, and other information that may be worth recording; such as a subscriber, whose address is in one place, requiring accounts to be sent to another; cross references where subscribers rent more than one connection, and, where a subscriber gives an order, and it is afterwards found that he is connected with a certain firm, the name of the firm is entered.

Apart from the information point of view these cards can be utilised for a variety of purposes in checking work, such as comparisons with fault cards, contract filing, or other matters.

As an instance of their utility, I may point out that in marking the rental folios on the cards we found in one instance that a subscriber had had an exchange line in use for seven years without any charge having been made for rental. In other words, after indexing all Newcastle subscribers numerically, one number was found to be actually working for which no rental folio could be traced. On the old rental registers being turned up, it was found that a note had been made early in 1901 to alter the due date, and the rental had been dropped out of the old folio without being entered in the new. Apart from this the indexing and comparisons have been the means of correcting many other discrepancies in names, addresses, etc.

I believe also that these cards could be used to advantage as an index to correspondence filing, subject to correspondence being filed under a numerical system, and the subscriber's telephone number, where any, being utilised for the purpose. If the correspondent has no telephone number, he could be given a special number (this being kept apart from numbers that are likely to be appropriated at exchanges in the ordinary course), and if afterwards he rented a telephone his old correspondence number could be cancelled in favour of the telephone number.

In some districts, I believe, these or similar cards are also utilised for addressing purposes, *i.e.*, accounts, notices, correspondence, etc., whether dealt with by the rentals, fees, works order, or any other department, are at first made out by the telephone number only without details of names or addresses. These accounts are then passed on to a junior clerk or office boy, who deals with the whole of the addressing, thus saving in most cases a senior clerk's time.

Returning to the use of the cards as at present kept, the numerical cards, as far as checked, have been the means of finding several cases of the appropriation and retention of telephone numbers on a switchboard for firms from whom no order was actually obtained, or, if obtained, subsequently cancelled. This arises from a variety of causes, and means, until discovered, the waste of an indicator on the switchboard.

It was intended at one time to embody details of instruments, etc., on the cards, the rental registers not now giving such information. I have put aside that idea owing to the additional work it would involve, which cannot at present be arranged for. I mention the matter, however, as some districts, I believe, still continue to enter instrument details in their rental registers, or have suggested to Head Office that they should be re-entered.

CARDS **B**

ALPHABETICAL.... 1475A.
NUMERICAL..... 1475B

Rental Register folios	Due.	Box.
~~Exchange~~ W.O. Nos.	Prefix.	No.
Name (surname first) •		
Description		
Address		
Extras		

Owing to the number of books and records that have been introduced in connection with the measured rates, it is intended to utilise the numerical cards periodically to ensure the correctness of these, and a comparison will be made, say, once a year, between these cards and the Post Office fee journals, measured rate journals, call office fee journals, private branch exchange cards, message rate journals, summary of calls books, automatic box records, etc.

By the aid of card prefixes shown on diagram "A" this work can be satisfactorily carried out.

A further important point as regards card records, where correctly kept, is that the names and addresses of subscribers might with advantage be left out of some of the books owing to the numerical and alphabetical cards both giving full particulars.

Taking the rental registers, for instance, the clerk using these here is working on the next desk to the clerk who keeps the card records, and, as precisely the same alterations and additions have to be carried out in the rental registers (as at present arranged) as on the cards, there is an obvious duplication.

Owing to want of time the street cards (Schedule 1475) are not yet started. At present we do not propose to start these, as street cards (Schedule 475C) are already kept at our local offices in connection with faults and inspections, and these are quite sufficient for the distribution of the telephone directory, which is at present the only purpose for which the district office would require a record of subscribers in street order

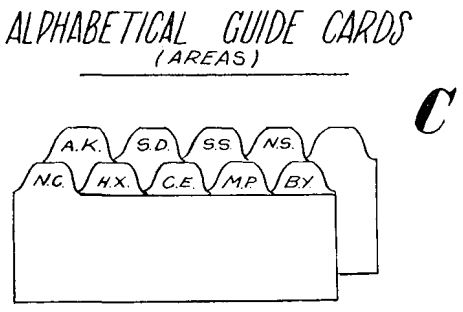
Before going further into the method of keeping the card records, I give illustrations on diagrams "C," "D" and "E" of

* Abstract of paper read before the Newcastle Telephone Society.

the guide cards used to divide the various exchanges from each other, and the arrangement of the actual cabinets.

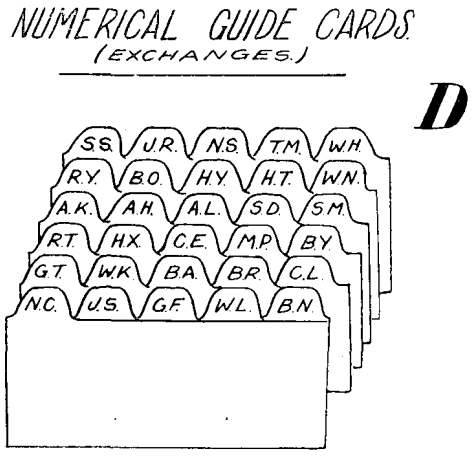
The numerical cards are arranged under the individual exchanges instead of areas, as all of the Company's numerical records, such as fault cards, fee journals, etc., are arranged in the same way. The alphabetical cards are divided into areas on the same principle as the entries in the telephone directory.

In entering up the alphabetical cards we go a step further than apparently intended by Head Office, inasmuch as we open cards for all works orders, whether affecting telephone numbers or not, these particular cards thus forming special alphabetical indexes of works order transactions with the outside public, including sales and other special work. It is questionable whether in time this principle



should not be extended by including wayleaves and other matters. In order to avoid confusion between names that are subject to entry in the directory and those which are not, the latter entries are made in red ink.

In the case of the numerical cards, only works orders are dealt with where a telephone number is affected. These are entered up on the cards the day after the works orders are issued, alterations necessary through removals, as well as additions of works order numbers for extra instruments or accessories, being included. The numerical cards thus form an index of exchange line subscribers whether for works order numbers or other details, and the alphabetical cards form a complete alphabetical index of exchange line subscribers, as well as of private wires and other items where reference is either necessary or useful.

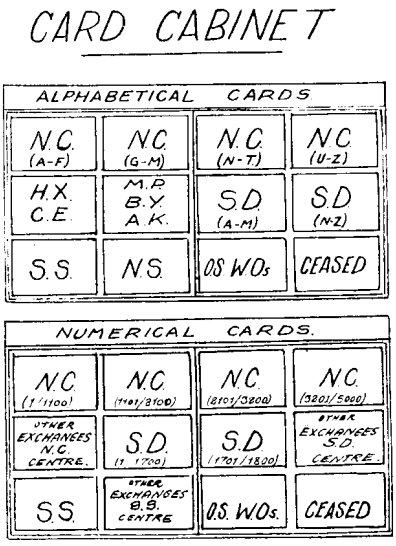


When a works order for a new line is issued, new cards, alphabetical and numerical, are made out, and these are placed in the outstanding works office drawers shown on diagram "E." When the work is completed these cards are placed amongst the completed cards, the rental folio and due date being added from the works order slips.

Where a works order is issued for alterations to an existing installation the cards, alphabetical and numerical, are taken out from the completed drawer, the new works order number is inserted, and they are placed in the outstanding works order drawer. On the work being finished, they are replaced amongst the completed. The cards in the outstanding drawers thus represent all outstanding works orders on hand at any one date, and although not utilised for this purpose at present they will doubtless later on be useful to verify at any time the number of outstanding orders.

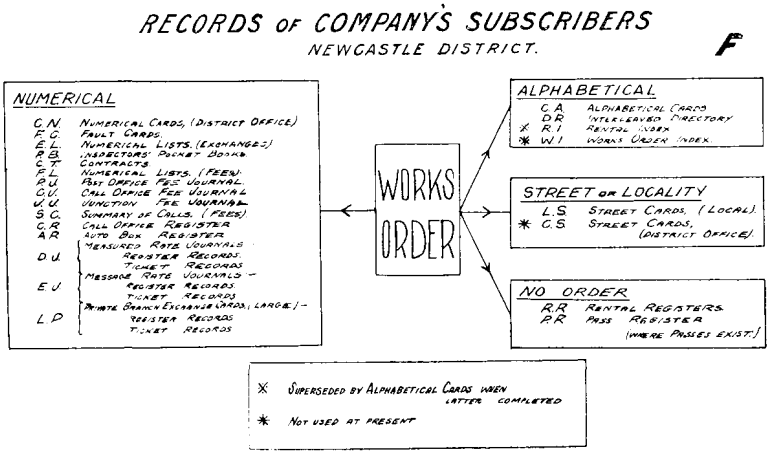
The individual cards shown in diagram "B," after being inserted behind their respective guide cards (diagrams "C" and "D"), are subdivided again as may be necessary for the large exchanges under separate letters of the alphabet (alphabetical cards), and in sets of 50 or 100 numbers (numerical cards)

In dealing with these cards a local directory (Ward's) has been found to be very useful both for adding to or checking existing



information as to names and addresses of subscribers. At one time it was thought worth while noting in this directory those cases where the firms or residents were telephone subscribers with a view to the information being made use of by the Contract Department in canvassing certain streets or localities. Owing to want of time, however, nothing has yet been done as regards this.

I give on a further diagram "F," a summary of records including the Company's subscribers. This is arranged to show those



that are in "Numerical," "Alphabetical," "Street" or "No order" respectively.

It will be noticed that the majority of these, whether in the district or local office, are dealt with numerically. On this account the numerical are the most important of the cards that are the subject of this paper.

In utilising one or the other of the records shown as a pivot for checking, the numerical cards for many reasons are best, and provided that one once get them fully and correctly completed with all necessary information they save the time spent on them over and over again.

It will be noticed on referring to diagram "F" that, in front of the records themselves, I have given abbreviations used here to represent such records.

In conclusion, I may point out that much of the checking, etc., referred to in this paper is at present purely theoretical, although such as actually has been done has demonstrated the necessity of carrying the principle further and the possibilities of the card records in this connection.

The card registers bearing a close relation to the works orders and fee department records, my original paper included diagrams and explanations of the procedure *re* the latter departments. These and a few other notes that refer more particularly to the local staff have been cut out in order to bring the paper down to a reasonable length.

"If the limits of this paper had allowed I should have liked also to have gone into the question of keeping records of sundry payments on the card system. I am under the impression that this is done at one district, although I am not certain as to this. If such is the case, perhaps the district in question would supply me with particulars."

TELEPHONE WOMEN.

XVII.—EMILY RICHARDS.

THE deservedly popular Clerk-in-Charge of Gerrard originally entered the service of the United Telephone Company as an

EMILY RICHARDS.

Operator at Westminster, in October, 1883, and like most of the senior operating staff in the Metropolis has been constantly transferred from exchange to exchange during her length of service, seeing many changes and vast developments.

Miss RICHARDS was one of the first operators employed on all-night service, when it was started in February, 1885, at Westminster and Heddon Street, these two particular exchanges being selected as it was considered the service might be found useful by members of Parliament. One of the two "Lady Inspectresses" was on duty at each of the exchanges, Miss RICHARDS being the operator selected for Heddon Street. On the first night one call only was made from the House of Commons to the Constitutional Club, the remainder of the small hours being occupied in driving mice from the exchange, which they had apparently hitherto looked upon as their happy hunting ground, and possibly resented the intrusion of "night staff."

Miss RICHARDS first appointment as Clerk-in-Charge was at "Edgware," in October, 1892. In August, 1897, she was transferred from "Paddington" to her present position at Gerrard. During her service she has seen three "Paddingtons" and three "Gerrards," and is justly proud of being in charge of the central battery exchange opened in the fine new building in September last.

The staff know they have a staunch friend in their Clerk-in-Charge and a sympathetic confidant in times of joy or trouble. Her chief pastime is reading, her favourite authors being LYTTON and DICKENS.

XVIII.—FLORENCE P. NICHOLLS.

MISS NICHOLLS entered the service of the Western Counties & South Wales Telephone Company, Limited, Bristol, in 1890. At that time the operating staff numbered nine, there being altogether four exchanges in the area, three of which were situated in the city of Bristol. The old peg board was then in operation. In 1892 the National Telephone Company, Limited, acquired the business of the original company, and three years later the old peg board was replaced by a magneto board with multiples. This was only in operation for five years, and in 1900 the whole of the Bristol apparatus was replaced by the common battery system (which was the first installed in the country), and at the same time subscribers connected with sub-exchanges were then brought direct on to the central.

FLORENCE P. NICHOLLS.

Miss NICHOLLS has therefore seen the working of three systems and an increase to over 3,000 lines. The operating staff now numbers 41, and when the additional equipment now in hand for an additional 1,600 lines and meter keys are in operation it is anticipated that the service given in Bristol will be second to none in the country.

Miss NICHOLLS' appointment as Clerk-in-Charge dates from 1905, and she has done much to bring into existence the present successful operators' society in Bristol, which is now one of the most active and flourishing societies of the kind in the country.

There is little doubt that with the present feeling of enthusiasm and active co-operation among the members of the operating staff the Bristol service will take a leading position in speed and efficiency.

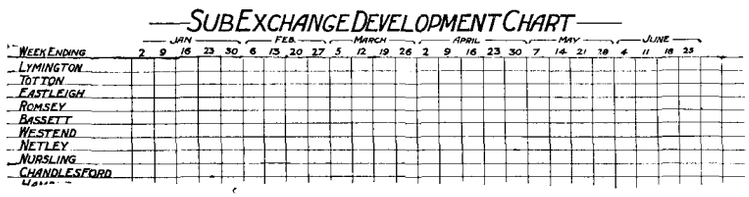
SUB-EXCHANGE DEVELOPMENT.

By F. W. GEORGE, *Contract Manager, Southampton.*

ALTHOUGH numerous interesting articles on Contract Department working and organisation have appeared in the JOURNAL, the important question of sub-exchange development has not been fully dealt with. It will be agreed that to obtain a comprehensive telephone development the tendrils of the system must be pushed outwards, and the development of the sub-exchanges forms a highly important part of a contract manager's duties.

The operations of the Contract Department in this district cover territory extending from the Surrey border of Hampshire to the extreme end of Dorset, encroaching on Wiltshire and Somerset; and, in addition to the five main centres, include the canvassing of 58 sub-exchanges, existing and projected.

To ensure the systematic canvassing of a largely rural district a sub-exchange development chart is in use, as shown in the illustration, which I trust will be of interest to JOURNAL readers. The



ETC., ETC.

chart, which provides for a complete six months' working, is got out on tracing linen, a blue print therefrom being fixed in a case, and shows at a glance the date of last visit and the results obtained, visits and orders being shown by a white and red disc respectively. Daily locality reports are sent in by the contract staff, showing the place and roads worked, the number of interviews made and orders obtained, the gist of the interviews being tabulated in the card index in each centre and the locality reports constantly checked against this.

This method has the effect of breaking up stagnation in rural districts, full advantage being taken of available Post Office routes, in conjunction with new National routes, to serve groups of subscribers, and the canvassing is not limited to local country from which the fruits may have already been plucked. Mere visits for attention's sake are not favoured, but only searching and thorough canvassing at proper periods; and the white discs on the chart show a real and general attack.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

Since April 1 the following grants have been made:—

	£	s.	d.
Traffic Department (*a*)	1	0	0
,, (*b*)	3	0	0
,, (*c*)	3	17	0
Engineers' Department	10	0	0
Metropolitan Office	2	8	0
Maintenance Department	2	0	0
Head Office (*a*)	2	10	0
,, (*b*)	3	14	0

Donations received: National Telephone Company (November to February) £42 4*s.* 2*d.*; ditto (March), £7 11*s.*; ditto (April), £9 15*s.* 10*d.*; George Franklin, Esq., £2 2*s.*; H. W. Parsley, Esq., 5*s.*; Proceeds of Hammersmith concert (per Miss Neller), £1 2*s.* 9*d.*; F. Gill, Esq., £1 1*s.*; C. Elliott, Esq., 10*s.* 6*d.*; Bank Exchange whist drive (per Mr. Wilkinson), £2 2*s.*; Apprentices' dance (per Mr. A. K. Ward), 12*s.* 6*d.*; F. M. T., 10*s.* 6*d.*

The Chairman and Directors of the Company have kindly consented to become patrons of the society, and the Directors have decided to give to the society an amount equal to that received in members' subscriptions during each month. The amounts shown above as received from the Company cover the subscriptions from Nov. 1 to April 30.

THE ANNUAL STAFF DINNER.

THE annual staff dinner of the National Telephone Company, Limited, was held on Thursday night, May 14, at the Empire Rooms, Trocadero Restaurant, Piccadilly Circus. Mr. Albert Anns, the Secretary of the Company, presided, and had on his right Mr. George Franklin, President of the Company, and on his left Lord Harris. Among the guests were Sir Frank Crisp, Sir Albert K. Rollit, Sir John Gavey, Sir John Cameron Lamb, Sir Robert Hunter, Major W. A. J. O'Meara, Mr. G. H. Robertson, Mr. C. S. Agnew, Mr. H. Fedden, Mr. E. Forbes Lankester, K.C., Mr. W. M. Mordey, Mr. A. N. Bromley, Mr. D. Sinclair, Mr. E. Honoratus Lloyd, K.C., Mr. T. A. Welton, Dr. R. M. Walmsley, Mr. G. F. Preston, Mr. J. Swinburne, Mr. J. E. Kingsbury, Mr. H. H. Gaine, Mr. L. Stokes, Mr. J. F. Bond, Mr. P. Hammarskjöld, Mr. A. St. G. Laurie, Mr. H. F. Anns, Mr. Alfred A. Clark, Mr. Sydney Thirkell, Mr. C. A. Baker, Mr. W. F. Harris, Mr. J. H. Fisher and Mr. W. S. Crawford. The chief officers present included Mr. Frank Gill, Engineer-in-Chief, Mr. S. J. Goddard, General Superintendent, and Messrs. C. B. Clay, A. Coleman, F. Cowley, J. C. Chambers, C. J. Phillips, R. A. Dalzell, F. D. Watson, W. W. Cook, E. Hare and W. E. Hart. There were also present, representing a staff of upwards of 18,000 and friends, the following:—Messrs. R. Aitken, W. Aitken, F. Albany, P. Alderton, H. J. Allen, V. Alsop, W. H. Anderton, C. F. Ashby, J. Ashton, H. Barnett, W. Barnett, F. Barr, A. Bascombe, E. C. Bates, T. A. Bates, A. H. Baxter, R. S. Beckwith, R. W. Bell, R. C. Bennett, E. S. Berry, J. H. Bigland, W. Biles, R. J. Blackwood, W. R. Bold, J. A. Bonathan, J. F. Bond, C. A. Bostock, A. Bowers, C. H. Brandreth, J. Bridger, J. W. Briggs, F. B. Brown, J. R. Brown, W. Brown, J. W. Campion, C. W. L. Carter, H. Chambers, C. Chanter, P. Chester, B. S. Cohen, J. O. Cooper, H. G. Corner, F. Cornfoot, A. E. Cotterell, W. Crompton, W. S. Crosley, W. Cullum, A. L. Curling, P. F. Currall, H. M. Darville, F. L. Davies, H. Davis, H. Deane, A. Dearle, A. L. De Lattre, A. C. Devey, F. C. Disher, J. D. Duncan, H. Eady, P. Edmond, J. F. Edmonds, C. Edwards, C. Elliott, H. Elliott, C. M. Ellison, A. S. English, C. E. Fenton, T. Fletcher, W. M. France, E. C. Francis, F. W. Francis, D. B. Fulton, J. R. Gall, W. E. Gauntlett, F. W. George, F. J. Gerrard, A. B. Gilbert, E. J. Gillett, G. Gillmore, R. Gilmour, W. J. Gilmour, W. H. Glencross, J. A. Gordon, A. C. Godfrey, A. Gray, H. C. Gray, W. J. Gray, G. F. Greenham, W. Haimes, A. C. Haley, J. W. Hambleton, F. C. Hawker, B. B. Hayward, E. J. Hidden, F. G. Hives, F. Homfray, E. Hooper, G. Hooper, W. Howe, J. Hudson, C. Hughes, J. H. Jenkins, F. K. Jewson, A. E. Jones, A. M. Kidd, F. G. A. Kiff, J. King, P. P. Kipping, W. C. Knapman, E. A. Laidlaw, A. R. Lamb, F. D. Latimer, G. F. Lee, O. G. Lee, H. Legge, J. Lemon, L. H. Lewis, W. U. Lonnon, J. N. Lowe, L. H. Lowe, S. Maber, D. Macadie, A. J. Mackie, A. Maclean, H. J. Maclure, G. M. Maddock, A. Magnall, W. Mann, A. Martin, G. A. McDonald, J. McLeish, J. Mewburn, C. J. Millar, H. C. Minns, S. Moody, C. F. Moorhouse, L. F. Morehouse, W. V. Morten, A. K. Murray, R. Murray, W. Napier, W. Noble, A. A. Notley, W. Padget, C. F. Peacock, H. M. Pease, W. V. Pegden, A. Perkins, S. J. Pharo, H. Phillips, H. S. Plymen, S. H. Pook, J. Poole, G. F. Pratt, P. H. C. Prentice, L. Price, T. A. Prout, A. Pugh, J. Pullen, C. G. Ransley, H. Reid, C. J. Remington, E. Roberts, F. W. Roberts, T. Rodger, A. E. Ruddock, C. W. Salmon, N. A. Saltmarsh, J. Scott, W. R. Senior, J. M. Shackleton, J. Shea, L. Shorrock, F. W. Shorrocks, C. H. Sibley, F. E. Sims, A. W. Smith, S. C. Smith, S. J. Smith, A. Spargo, O. Stevens, J. D. W. Stewart, W. D. Stewart, J. Stirling, E. E. Stockens, J. H. Storrie, D. Stuart, C. H. Summers, H. B. Sutcliffe, G. Sutton, J. W. Swithinbank, C. E. Tattersall, F. W. Taylor, W. Taylor, W. F. Taylor, J. S. Terras, H. S. Thompson, A. T. M. Thomson, H. H. Thomson, J. E. Tinker, A. T. Turney, F. H. Tyas, J. W. Ullett, W. A. Valentine, B. Waite, T. C. Walker, J. H. Wall, A. F. Wallis, F. E. Waters, J. K. Waters, A. Watts, B. J. Wells, W. E. Weston, J. W. Wheeler, J. T. Whitelaw, J. E. Williams, R. H. Williams, E. Williamson, G. Wilson, J. H. Wilson, W. F. Winfield, J. C. Witherby, J. Wolff,

A. F. Wood, F. A. S. Wormull, C. C. Worte, J. Wrigley, and representatives of the following papers:—*The Times*, *Standard*, *Daily Telegraph*, *Daily News*, *Electrician*, *Electrical Times*, *Electrical Review* and *Electrical Engineering*.

After dinner, the usual loyal toasts having been proposed by the Chairman and enthusiastically honoured,

The CHAIRMAN, again rising, said his presence there that night in the chair must remind them all that since they last met a great calamity had overtaken them. He hoped they would forgive him if for a moment he referred to that tragic event of June of last year which took from them their Chief and robbed them of a friend for whom they had a real affection. He knew Mr. Gaine longer and, he thought, more intimately than any other member of the staff, and he desired to take that opportunity of saying how much he admired him for those qualities with which he was so richly endowed and which made him what he was, a born leader of men. Mr. Gaine never knew when he was beaten. Time and again when things looked black for the Company he either turned apparent defeat into victory or he brushed aside the weapons of their adversaries so that they passed by harmlessly. He did not think that they could overestimate the value to the Company of the example which Mr. Gaine set them of courage, perseverance and determination. ("Hear, hear.") He was called away before he saw the full fruition of his long and strenuous work, but his spirit would animate them and be with them to the end. ("Hear, hear.") He (the Chairman) had been asked by several of the gentlemen who had been invited to that dinner to express their regret that they were not able to accept the invitation that evening. Mr. Sydney Buxton, His Majesty's Postmaster-General, was that day unveiling a memorial to the sorters and postmen who lost their lives in the terrible railway accident at Shrewsbury which happened a few months ago. Mr. Babington Smith, the Secretary of the Post Office, and Mr. Ogilvie were representing the nation at the International Telegraph Conference at Lisbon, and he was particularly asked by Mr. Babington Smith to say how much he regretted not being able to be present. Sir William Mathews, the President of the Institution of Civil Engineers, and Col. Crompton, President of the Institution of Electrical Engineers, would have been with them but for the fact that they had accepted prior engagements. He need hardly say that had they been fortunate enough to have had these gentlemen with them, they would have accorded them a very hearty reception. It was their good fortune to have with them that evening other distinguished representatives of that great department of the State, the Post Office, and he thought he could speak for them all and say how much they appreciated their presence. ("Hear, hear.") The year 1907 was a gloomy one for them in many respects. In the early part of the year by that terrible convulsion of nature, the earthquake in the island of Jamaica, they lost a Director in that true and gallant gentleman Sir James Fergusson. Later in the year they had to mourn the loss of one who was always a welcome and an honoured guest at their annual gatherings, a great scientist, one who taught them much and yet withal was a kind and genial friend, the late Lord Kelvin. ("Hear, hear.") The Company was the poorer and the world was the poorer for the losses to which he had referred. Two years ago they were in conflict with several municipalities which had rushed into the telephone business. He thought the eminent citizens who started the competition were sincere in their belief that they could run the business at much less rates than those which the Company charged. Had they known the truth that the rates which were then in operation were giving the Company only a fair and moderate margin of profit, he did not think they would have entered into the competition at all. Those who knew prophesied that it could only end in disaster to them, and, as those present were aware, in the case of Glasgow and Brighton the Government had come to their rescue, and at Tunbridge Wells and at Swansea the burden had been shifted on to the shoulders of that very patient, long suffering and much abused Company. ("Hear, hear.") Then another thing had happened which had stirred the community to its very centre. It was not the Licensing Bill or Tariff Reform, or even by-elections, it was the introduction of the measured rate. Well, after a year of educating the public, it was a great satisfaction to know that not only individual subscribers but corporations, chambers of commerce and other large bodies were now acknowledging that the measured rate was a just and equitable rate and the proper way to charge for the services which the Company rendered. The measured rate was without doubt the right and correct rate and the measured rate had come to stay. With regard to the progress of the Company during the last twelve months they had opened 176 new exchanges, and this did not include those cases where an exchange became obsolete and was destroyed and a new and up-to-date exchange took its place. In that respect he might refer to the Gerrard Street Exchange. There an exchange had been erected of which he thought any company, or any nation, might well be proud. The building and the exchange had cost the Company over £150,000 and like everything that the National Telephone Company took in hand it was as perfect as money and brains could make it. If there was anyone there who had not seen it he hoped that he would take an early opportunity of visiting Gerrard Street, and seeing for himself the wonders of a modern telephone exchange. Then he came to a question which was somewhat personal to all of them, and that was with regard to the future. He had had enquiries from several members of the staff who had confessed to him that they were very anxious and very uneasy as to what might happen to them in 1911. He had pointed out to them that in the past the Directors had never been guilty of anything that was unfair or unjust to any member of the staff and he had asked them why they were so fearful that in 1911 the Board would be less mindful of their interests, or that they would then permit anything which was unjust or unfair to be done to any member of the staff. To him that was a sufficient consolation; but he would add, as he thought it would carry some further comfort to them, that when the Government took over this undertaking they were going to have a wonderful bargain. He would not go into the figures because figures were like boomerangs—you sometimes wished you hadn't used them, but he would give them this information so that they could work it out for themselves. Assuming that the Government could raise any amount of money they wanted at 3 per cent. the published accounts of the Company would enable them to see in what a short period the Government would re-imburse themselves for the money they had paid for the undertaking, or in other words, that they would obtain that business, which at the present time had an annual revenue of nearly £3,000,000, practically for nothing. Whatever political party might be in power in 1911, and whoever the Postmaster-General might then be, he could not, and would not, believe that the Government of that day would deal other than generously with the men and women who had made that business such a remarkable success. For after all who had made the business what it was? Under the guidance, direction, and control of the Board, it was they and their telephone brothers and sisters who were not there that night, to whom the credit was due. One point he desired to mention, because he thought there was some uneasiness in the staff about it, and that was in regard to the Pension Fund. The questions that had been sent to him indicated rather a feeling that this pension fund would not be equal to its obligations in 1911. That was entirely erroneous. The pension fund was absolutely sound, and although some of the smaller investments to-day showed a depreciation he thought that the investments, taken as a whole, would compare favourably with the investments of any bank, insurance, or other company in the city of London or any part of the United Kingdom. There was a saying "You should never prophesy unless you know," but he would prophesy this that when the pension fund was wound up and the assets distributed there would be a very handsome surplus in which every member of the fund would participate. He hoped that what he had said would somewhat allay their anxiety of mind because the progress and prosperity of the Company was inseparably bound up with the happiness and welfare of the staff. ("Hear, hear.") He desired to ask them now to drink to the continued prosperity of the National Telephone Company, and with that toast he coupled the name of their esteemed President and Managing Director, Mr. George Franklin. (Loud cheers.)

Mr. GEORGE FRANKLIN said he rose with considerable diffidence to respond to the very able speech which the Chairman had given them in proposing success to the National Telephone Company. His first words would be those of warm congratulation to Mr. Anns, their Secretary, upon the excellent way in which he had

discharged his duties in the chair that night. (Cheers.) No man on the staff of that Company was more deservedly popular than Mr. Anns, and so it must be a pleasure to the Directors of the Company to find their Secretary was in the chair on the occasion of that staff dinner. The Secretary in his opening speech struck a sombre note which one must take up and re-echo, and that was his allusion to the great loss the Company and the staff had sustained, not merely by reason of that tragic event to which he had referred, but also by reason of the removal of other valued members of the staff—their Assistant Superintendent for London, Mr. Bailey, and their friend Mr. Distin, as well as Sir James Ferguson and Lord Kelvin. These losses made them feel indeed the truth of Edmund Burke's saying "What shadows we are, what shadows we pursue!" Their task in paying a tribute to the memory of those who had gone was none the less when they realised the loss of those whose hands they had clasped in friendship, and whose voices still found an echo in their hearts. And there, that night, they felt that, after all, they were in spirit animated by those who had gone before them and who had left them examples which were not as lights kindled for a moment, but which would live on in their good deeds and in their venerated memory. The Chairman had referred to one or two questions to which he would like to allude at that gathering, and which happily were not controversial. One was the question of the measured rate. They had heard a great deal of this question, and it must to all of them, as it did to the Board, seem perfectly reasonable that if they found that for 27 years they had been supplying a service upon a wrong principle, whilst it might be right to continue that principle to those who had taken their service upon existing agreements, it could not be right to continue a policy which the Board absolutely believed to be wrong. They had spent so many millions of money in supplying a service on the basis of what was called the flat rate—that was a charge for unlimited user, but they preferred for the three or four remaining years which rested with them to make such a charge as would at all events secure a moderate and modest return upon the capital as yet to be expended, and that was surely not an unreasonable proposition. Another matter to which the Chairman had referred was one which he should at once like to take up, and that was the question with regard to the future of the staff. It was perfectly clear, following on the agreement of 1905, and the declaration of Lord Stanley in the House of Commons, that the staff were entitled sooner or later, and he thought it might be sooner rather than later, to obtain from the powers who were to enter into the Company's inheritance in the year 1912 something in the nature of an assurance as to what their position was to be under the new arrangements that were to follow. He did know this, and in this matter he spoke for his colleagues on the Board, that not the least, he might say the greatest, of all the assets which the Postmaster-General was to take over in 1912 would be the energies and devotion of the staff of the National Telephone Company. He had no reason to doubt that the Postmaster-General and the Government of the day would be able to give to the staff of that Company such assurances as would satisfy them that at all events in the transfer they would not be unfairly or unjustly treated. So far as the Board were concerned, without having had any conference with his colleagues, he begged leave to say at once that they would take every opportunity during the negotiations of doing what they could to see that no single member of the staff was placed at any disadvantage by reason of the transfer of that magnificent business to the State. (Cheers.) The Chairman had referred to the pension fund and he hoped that the assurances given had been satisfactory to them that this fund by its own contributions, by the large contributions which the Company had made to it in order to make it solvent, would in itself form a handsome nucleus to be dealt with when the time of transfer came. There were difficulties in the way to be adjusted, because there were differences between the conditions of service in the Company and in the Post Office, but those were difficulties and differences to be got over and adjusted, and so far as the Board were concerned they would do their utmost to that end. He had no doubt that the staff would in the future, as in the past, rely on the assurances which were given. At the same time he desired to say that the Board did not discourage any organisation among the staff themselves with that object, and would do their utmost to further the interest of the staff to the end to which he had just referred. Now with regard to the Company itself. They were within a few years of the probable termination of the Company's existence and of the end of their license, and it was surely reasonable that they should reflect upon the progress they had made, and the progress which might have been made. They knew that in point of view of income and capital expenditure those items doubled with them about every seven or every eight years. The Company doubled itself in size every eight years. If that large progress was possible under adverse conditions such as those to which he would shortly refer then he wanted to point out what greater vista of possibilities would open before the eyes of his friend the Engineer in the Post Office, and his friend Sir Robert Hunter, when they looked upon the business to be taken over in 1912. During the past year they had added 36,085 stations, and had now a total of 457,564 stations, representing 1 to 96 of the entire population, as compared with 1 to 114 when last they met. Those were the figures of the Company, and did not include the figures of the Postmaster-General. The ratio of development had been greater than that of all the countries of Europe except Sweden, Norway, Switzerland and Denmark. They had more telephones than any continental country except Germany, and, if they excluded that country, there were more telephones in Great Britain and Ireland than in any five other European countries put together. The total number of messages per annum, 1,313,511,576, was an increase of 136,204,744, and the cost of these messages was ·45*d.* as compared with the same figure last year. When they considered that enormous business and the great development which had taken place they were entitled, at all events, to claim that whatever were the interests which had been neglected, they had certainly not neglected the interests of the public. The interest of the public had already been served by what had already been done, but to those who laboured in producing these results it was surely unnecessary to dilate upon the great difficulties with which they had been hampered. It was some 28 years since the Post Office first gave the license and the license was the only thing they did give. (Laughter.) During those 28 years they had given the Company the license and they had taken £2,600,000 sterling as royalty in respect of that license. In a business where the wayleaves either over the streets or under the streets were absolutely essential not one was given. Repeated applications were made to Parliament, but not one was listened to, and it might have been imagined that after the license had been granted they surely might have been given 31 years within which to make their business pay and render their enterprise successful, but the powers that be thought otherwise, and they had had no less than seven Parliamentary enquiries into their business during the course of the 28 years that had gone, and Heaven only knew how many more they might have before the three years they had still to run expired. (Laughter.) When they considered the amount of capital put into the business they could, at all events, never say that the State did what it could to safeguard that capital. It was sometimes said "Oh, but the shareholders in the Company have done extremely well." The other day at the shareholders' meeting he told them that the average annual return which their shareholders and debenture holders had obtained on their capital in that Company had never equalled the modest figure of $4\frac{3}{4}$ per cent. He might be told "That is all very well, that is the dividend you pay, but look at the enormous sums you set aside to the reserve fund." Those sums were set aside for a definite purpose and they might or might not be wanted, but even if they included the sums paid to reserve the total profits, including those sums, had never equalled $6\frac{3}{4}$ per cent., so when they heard the uninformed speak of "the bloated monopoly" and the "splendid returns" the shareholders of that Company had got he begged them to call to mind how little assistance the Company had received from those who created it, and how very much they had had to depend upon their own right arm in order to protect the just and proper interests of the shareholders. ("Hear, hear.") If he indicated the difficulties with which the Company had had to contend, it was only that he might the more forcibly call attention to the fact that it was to the staff of that Company that the Board of Directors felt largely indebted for the work that had already been done. No Company had ever had a more loyal or more devoted staff than the staff of the National

Telephone Company. It was the least that one could say as representing the Board of Directors, and he said it quite emphatically and meaning it, that everything that the Board could do to further the interest of those who had loyally stood by them in dark days, as well as in brighter days, would be done. And when the time of transfer came their friends from the Post Office would find that among the great accessions to the staff they would receive, they would find none more able, none more shrewd, and none more devoted than the recruits of the National Telephone Company. It was a great pleasure again to partake of their hospitality, and it was particularly so to be able to speak, as he did that night, upon subjects upon which he knew they felt a very deep concern, and he wanted them at all events to realise that at headquarters they had a sympathetic touch which would make them feel they were all one in the common object they had to serve, to satisfy the interests of the public for the next few years, and to satisfy their shareholders at the end. (Cheers.)

Mr. S. J. GODDARD said that the toast of "The Visitors" had been placed in his hands, but before he spoke on that subject he felt sure he should be echoing the sentiments of all the staff when he thanked the President on their behalf for what he had said with reference to their position at the time of the transfer to the Post Office. He felt sure that the assurance he had given of the sentiments of the Board would delight them all and would be a comfort to them. He desired to tender to him on behalf of the staff the assurance of their unswerving loyalty to the Company, and in doing that he felt sure that the officials of the Post Office and the Postmaster-General would fully appreciate the fact that a staff which was loyal to the Company during the whole time of its existence would be equally loyal to the Postmaster-General when he took the control of them. ("Hear, hear.") Dealing with the subject of the toast, they had there that night, as it was always their pleasure to have, a large number of their Directors. Unfortunately three of them were away. Sir Cuthbert Quilter was unwell, Mr. Sands was unable to be present because he had had a serious motor accident, and he presumed that Mr. W. A. Smith was not there because he was a large producer of motors and would be afraid to face the staff in consequence of the accident to Mr. Sands. Now they were particularly favoured on that occasion, because they had several friends from the Post Office. They very much regretted that Mr. Babington Smith and Mr. Ogilvie were unable to be with them in consequence of their official duties, but they had present as representing the Post Office staff Sir Robert Hunter and Major O'Meara, and they had as representing, if he might call it, the past staff his friends Sir John Lamb and Sir John Gavey. That he knew would be a satisfaction to them. They had also two representatives of the Institution of Electrical Engineers in Mr. Mordey and Mr. Swinburne. Among others they had as guests that night two whose names would immediately appeal to them. One was their old friend Mr. Sinclair—(cheers)—and the other was another old friend Mr. Preston. (Cheers.) A very large number of those present that night had been listening to him that day, perhaps more than they had wanted to do, and he felt sure they would not want to listen to him any longer. ("Go on!") He was going to couple with that toast two visitors who would, no doubt, be especially acceptable to them. One was Sir Albert Rollit. (Cheers.) Now Sir Albert Rollit was connected, in his mind, with three very curious things, green ginger, bees and snow. He would tell them how these three articles came into conjunction. The first time he ever saw Sir Albert was in Hull on Jan. 18, 1881, when he visited his office in the "Land of Green Ginger," which was the name of a street in Hull. On that particular evening he went to hear a lecture at which Sir Albert Rollit presided, and Sir John Lubbock discoursed on bees. That was the night of the great snowstorm. Thus Sir Albert Rollit was connected, in his mind, with green ginger, bees and snow. The other gentleman whom he was going to ask to reply was Major O'Meara, who was, as they knew, the Engineer-in-Chief of the British Post Office, and a more important position and a position of greater responsibility it was hard to imagine. He knew they would agree with him when he said that Major O'Meara filled that position in a way that no one else could fill it. He asked them to drink with him to their visitors. (Cheers.)

Sir A. K. ROLLIT said that Mr. Goddard had given them a little biography of him (Sir Albert) which was partly true and partly otherwise. (Laughter.) It was true in associating him with the second of these things; he was proud to belong to the busy bees; he hoped snow was intended to be typical of his character—(laughter)—but whilst he admitted that he came from the "Land of Green Ginger," he could not admit that he came from the "green" land of Yorkshire. That Yorkshire was not "green" at any rate was illustrated to him years ago, before the Japanese became as well known as they were now, by a Yorkshireman, who said: "I think, Sir Albert, those Japs are wonderful fellows. He (Sir Albert) replied, "How are they?" The man said, "They come over here and make these wonderful bargains." He (Sir Albert) said, "Do you mean to tell me they get the better of you?" The response was, "No, of course not, but I'se Yorkshire." When he heard of Lancashire praised and Yorkshire styled "green" his county pride was brought into action, and he said without fear that Yorkshire was the premier county of this country, and that Yorkshiremen wore the white rose, but never the white feather. ("Hear, hear.") He was there as one of their guests with great pleasure, and it was an additional satisfaction for once to be supported by the Post Office, although he was bound to add that the royalty to which reference had been made had always appeared to be something in the shape of a Post Office pillory, which was not advantageous to that Company. However, he welcomed his co-respondent Major O'Meara—(laughter)—and he would be glad if that gentleman would vindicate both the royalty and the pillory he associated with it. His difficulty that night was that, having responded there for fourteen years successively, he hardly knew what to say, or how to begin. When he was in the same difficulty once and rose to speak he muttered, more to himself than to the lady next to him, "I don't know what to talk about." She said, "If I were you I would talk about a minute and a half." He did not think he could do justice to the toast in the time. A number of men were discussing their wives, and one said to the other "Well, as a matter of fact I haven't spoken to my wife for six months." "Well," said his friend, "that is I think an unmanly, an ungracious, and an ungallant thing." The other replied, "I haven't spoken to my wife for six months because I do not want to interrupt her." (Laughter.) Then the ladies themselves did a large amount of talking, and they interrupted with a bell. The ladies of telephone were very familiar with bells, but they did not interrupt. They did not belong fortunately to those ladies who were carried away by their feelings, and afterwards by the police. (Laughter.) He was determined to come that night, notwithstanding a cold from which he was suffering, because of pleasant recollections he had of former occasions. He took the course of the minister who wrote to his colleague saying, "I will come and preach for you on Tuesday, D.V., but in any case on Wednesday." (Laughter.) There he was, and he had the greatest pleasure in taking the opportunity of thanking the staff for the cordial reception which had been given to the guests. He knew full well the loyalty of the staff, both in London and in the provinces. He knew their energy and zeal on behalf of the Company, and he also remembered when they had an emergency to deal with how they tackled it—as for instance when an exchange had happened unfortunately to be burned down. They possessed initiative which enabled them to overcome difficulties. He remembered once a noble duke who imported an emu which he wished to acclimatise. The emu was thought to be about to lay an egg. The duke was called away, but gave strict instructions to his bailiff. The letter he subsequently received was as follows:—"Your Grace, the emu has laid an egg, and in the absence of your grace we put it under the biggest goose we could find upon the farm." (Laughter.) They of the National Telephone Company were all for progress and development, and he was sorry to say that in that effort they sometimes met with more opposition than they deserved. That recalled an incident in the House of Commons when a Bill was introduced for the improvement of the dock accommodation in Liverpool. An Irish member delivered himself somewhat as follows:—"Mr. Spaker, sorr, what does Liverpool want with more docks? Liverpool, sorr, has plenty of docks, but where I come from, Mr. Spaker, there are no docks at all. Sorr, there is not a canal. There is not the blessed say. It is at Ballyrickett in the centre of Ireland, sorr. That is where docks are wanted, and not at Liverpool where there are plenty of

docks." (Laughter.) He was glad also to notice year by year, in accordance with what he had so persistently advocated, that greater advancement on the part of the staff in technical knowledge and science had been accomplished. The great want of this country was undoubtedly improved education, but things were mending. At the University of London, and now through one of their colleges, the School of Economics, even army officers were learning about business, and how to keep accounts. The principal of the school was Mr. Mackinder and the subaltern, when he was going to the school, said he was going to the *Mackindergarten*. The Company had made great progress as they had heard. The difficulties which seemed great had been overcome. Relations which seemed strained with the Government, and with various departments, had been reconciled, and now they had that night the more than usual phenomenon, not of the lion and the lamb lying down together, but of the lion and the lamb standing up together, as between the Company and the Post Office. At a menagerie one of the blessed emblems of peace that was shown was that of the lion and the lamb lying down together in the cage, and one of the audience said, "Would you mind telling me what becomes of the lamb?" "Well," said the proprietor of the show, "we do, as a matter of fact, have to renew the lamb at times." (Laughter.) He hoped that was not prophetic of what might happen to the lamb of the Telephone Company in 1911. He did hope that for the sake of the country there would then at least be a durable alliance between the lion and the Company. He thanked them once more for their most excellent entertainment to-night. There had been every excuse for taking a draught. They had a license, they knew, but unfortunately they had a time limit as well. There were several excuses for taking a draught.

> "Good wine, a friend, or being dry,
> Or lest you should be bye and bye,
> Or any other reason why."

They had everything that the staff could place at their disposal. They might if they liked imitate the Scotsmen who went to Paris for the first time and when they had had a great deal of champagne one of them said to the other: "Sandy, let us have a draught of whisky. I do not care about these French mineral waters." (Laughter.) They had had everything, and he was afraid if the visit were greatly prolonged on the same principle they would have a recurrence of what took place at a dinner of the Irish bishops when the Archbishop of Dublin said to his colleague: "My lord of Cork you stop the bottle." He replied: "Then I must be screwed." (Laughter.) They had had every possible entertainment. He hoped dining would never become a lost art or hospitality an ancient virtue. The Directors especially, who knew them so well, thanked the staff in the words of the great poet: "We can no other answer make than thanks, and thanks and ever thanks." (Cheers.)

Major W. A. J. O'MEARA said that, after the very eloquent manner in which Sir Albert Rollit had responded to the toast he feared there was very little for him to say, but as Sir Albert had replied to the toast as one who had been for long associated with their camp he supposed that he had better take upon himself the duty of responding for those who lived in the rival camp and speak for his colleagues at the Post Office. He was sure they would excuse him for referring to that sad event which deprived them of their chief last year. He knew how much Mr. Gaine was esteemed by them all, and he could assure them that their friends at the Post Office felt the loss almost as keenly as they did. They had the advantage, perhaps, of seing him from that point of view which enabled one to realise what was really in a man, and that was the point of view of an opponent. It was his good fortune to be brought into contact with Mr. Gaine on more than one occasion, and from the very first time he met him—when he did not know who he was—he was struck by his ability. In the negotiations carried on between the Company and the Post Office he was impressed with the great tenacity with which he fought for the interests of the Company, and, as Mr. Anns had so clearly put before them, he never knew when he was beaten. He (Major O'Meara) did not say that the Post Office beat him, but still he never showed in the smallest degree that he was at all in a bad position. With regard to the presence of representatives of the Post Office at the feast, they would, of course, remember that a great many of them met last year. That was not the first armistice that had taken place. They had an armistice last year, and he hoped they might have an armistice in succeeding years until they were able to capture the fortifications of the National Telephone Company. He knew that the siege had been going on for a very long time. The artillery bombardment had taken place. The outposts had been occupied one after another, and he thought that now they might consider they were driving their sap-heads. He knew that the fight would not be an easy one. He was quite sure that their friend Mr. Gill would resort to all the devices at his command and there would be a warfare of minds. What they felt at the Post Office was that when they came in contact with the Company's staff officers they realised that the saying "Like master, like man," was a very true one. The Company was very much to be congratulated on the quality of its staff officers; therefore it followed that it must also be very much congratulated on the quality of its rank and file. He spoke both for himself and for all his colleagues when he said he was very glad to have had the opportunity of meeting them there that night. They had met as opponents perhaps, but he hoped before long they might meet as colleagues. He thanked them for the very kind way in which they had received the toast proposed by Mr. Goddard. (Cheers.)

Mr. W. A. VALENTINE proposed the toast of "The Chairman," and said he felt it a great honour to be selected for this task. Mr. Anns was an old officer of the National Telephone Company, having commenced his connection with that undertaking as far back as 1881 as Accountant. At that time the capital of the Company was only £400,000; it was now £14,000,000, and their shareholders numbered between 14,000 and 15,000 persons. The number of officials, staff and operators had increased proportionately. Mr. Anns had been Secretary of the Company since 1890. His courtesy and good feeling to all who came in association with him, and his elevating influence, had done much to make the staff of the National Telephone Company what it had become. If after the transfer to the Post Office in 1911 Mr. Anns had any spare time, he, Mr. Valentine, took the liberty of suggesting that he should write a book on the history of the telephone, and if he told all he knew he could promise Mr. Anns that the book would have a large sale. He was himself closely identified with the pension fund of the staff of the National Telephone Company. This fund had been started by Mr. Gaine, and Mr. Anns had been secretary of the fund from its inception. He was sure it was gratifying to the staff to learn of the support and sympathy they were receiving and would continue to receive from the Board of Directors. The staff had undoubtedly felt some anxiety, and this anxiety would be greatly relieved by what had fallen from Mr. Anns and Mr. Franklin and other officials of the Company. The thanks of the staff were due to their President for his announcement that the Directors would use their earnest endeavours that the staff should not suffer at the time of the transfer. For Mr. Anns the staff felt the greatest respect, and he was one of the most popular members of the staff. He called for three cheers for the Chairman.

The toast was drunk with enthusiasm and with musical honours.

Mr. ANNS briefly replied and said he was deeply sensible of the kindness shown to him by the way in which the toast was received. It was a great honour to have presided over such a happy gathering, and he would always remember that evening with feelings of much pride and pleasure. He was unable, however, to fall in with the suggestion that if he had any leisure he should write a book on the telephone. He assured them he would rather spend any leisure time he might have in learning to play golf. (Laughter.)

This completed a very enjoyable function, for which an excellent musical entertainment was provided, the artistes including Miss Carrie Herwin, Miss Frances Roscorla, Mr. Nelson Jackson (of Messrs. Maskelyne & Devant's Company), and Mr. Spender Thomas, with Miss P. Adami at the piano. During the dinner an excellent programme of music was played by Farbon's Viennese Band.

WATFORD THRIFT CLUB.

A THRIFT club was recently formed here and is being well taken up by members of the staff.

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THE STAFF DINNER AND OFFICERS' MEETINGS.

THE resumption of these interesting social and official functions after last year's postponement was the event of last month in the National Telephone world. The reunion of the members of the widely scattered staff, the coming together of old friends separated by the exigencies of the service, and the resultant useful exchange of ideas give a distinctive character to these gatherings, which, naturally, are eagerly looked forward to.

The Fourteenth Annual Staff Dinner was marked by the occupancy of the chair for the first time by Mr. ANNS, who, in a speech full of matter of great interest alike to his audience and to the rest of the staff, opened the most important part of the evening's proceedings. Several sympathetic references were inevitably made to the loss of the great chief who had been the central figure at all the long series of these annual gatherings in the past. The meeting and dinner owe their inception to him, and his bright and encouraging speeches played a memorable part in their success. The usual astonishing figures of the spread of telephony under the Company's energetic guidance were given, and a welcome note was struck in Mr. FRANKLIN's loudly cheered speech when he expressed his warm sympathy with the objects of the Staff Association and stated his opinion that the Board would do their utmost to ensure that none of the staff should suffer by the transfer of the Company's business to the State. Mr. GODDARD, in proposing the health of the Guests, addressing the departmental officials who were present, told them that the unswerving loyalty of the staff to the Company augured well for their future loyalty to the State. A cherished institution of the Staff Dinner is Sir ALBERT ROLLIT's racy speech with its illuminating anecdotes. Sir ALBERT boasted that he had never missed one of these functions, and it is a fact that at least on one occasion when his duties at the House of Commons detained him until a late hour, although he missed the dinner he was in his place in time to make a speech, an effort much appreciated by the staff.

Another interesting feature of this year's dinner was the presence of leading Post Office men after an interval of eleven years. An important engagement precluded the attendance of Mr. SYDNEY BUXTON, and Mr. BABINGTON SMITH and Mr. OGILVIE were abroad attending the International Telegraph Conference at Lisbon. The department, however, was worthily represented by Major O'MEARA, the Engineer-in-Chief, and Sir ROBERT HUNTER, and the staff were very glad to welcome once again Sir JOHN CAMERON LAMB and Sir JOHN GAVEY.

The Officer's Meeting which occupied two days was productive of much useful discussion and many suggestive ideas. It was found impossible to hear all the speakers who were prepared to criticise the prepared papers, which, together with the speeches upon them, obviously represented an enormous amount of time and trouble. Mr. GODDARD in an appreciative and appreciated summing-up pointed out that no suggestion made by members of the staff went unconsidered, and that because members did not hear of the adoption of their ideas they must not think that they were not weighed and discussed; and he gave instances of the unexpected objections which frequently militated against the adoption of promising suggestions. Mr. GILL, who took the chair during the criticism of the papers on traffic and overhead cables, reminded his hearers that Head Office did not consider itself the sole fount of wisdom but was always prepared to learn—from the provinces or elsewhere. The meetings seemed to be infected with a spirit of intelligence and enthusiasm which, we think, is a most gratifying evidence of the temper animating the staff.

THE PRESS AND "GERRARD."

A VISIT to a modern telephone exchange by anyone not hardened to its marvels by daily familiarity must needs furnish matter for admiration and instruction. The members of the Press who inspected the new Gerrard Exchange at the Company's invitation appear to have been impressed by what they saw, for whether the accounts they have written are plain, statistical records, or ornate journalistic efforts, the note of praise and wonder is unanimous. "Telephone Fairyland," "Telephone Wonders," "Hall of 26,000 Lamps" were some of the headlines which caught the eye; and, indeed, the incessantly glowing lamps and the rapid, silent and continuous work of connection and disconnection seems to have left its impression on all the visitors. "To the man who, in his haste, calls the telephone and the telephone operator unbecoming names," says the *Daily Chronicle*, "a visit to the Gerrard Exchange must bring a spirit of humility and repentance." The representative of the *Daily News* "regretted that he had ever said an unkind word to a telephone operator." The Company is familiar with this amiable spirit in subscribers—after a visit to an exchange; it illustrates most pointedly the French proverb, "To know all is to forgive all."

The magnitude of the figures of the number of subscribers, lamps, junctions and calls, and of the mileage of wire also struck the visitors' imaginations. The 175,000 calls made each day and the 24,000 passing through the Gerrard Exchange during the busy hour caused the *Pall Mall Gazette* to reflect that "If a visit to 'Gerrard' did nothing else, it would convince the most sceptical that the 'telephone girl' is not the irritating and dilatory young person she is conceived to be." The same paper remarks that to

the ordinary subscriber "Gerrard" is little more than a name; which reminds us that the names of the Company's exchanges are becoming "familiar in the mouth as household words." As the word "Euston" is self-explanatory to the Londoner, so the words "Gerrard" or "Avenue" require no qualification, and occur in modern novels and plays without puzzling the reader or hearer in the least. With the intricacies of Clapham Junction or some particular large railway station which we constantly use, however, we are all personally familiar, but with the inside of an exchange the case is very different. A man may use an exchange a hundred times a day and yet his idea of a switch-room, if he ever thinks of it at all, may be a place with falling shutters and loudly tintinabulating bells—gained from hearsay or some ancient periodical. Therefore the Company welcomes the visits of the telephoning public and much appreciates such descriptives articles in the Press as tend to enlighten the world on a little known and much criticised matter.

POSTAL ORIGINS.

THE historical sketch by our correspondent on the subject of "Communication" deals with a matter of more than antiquarian interest to telephone men. As our correspondent says in his opening words, "We exist to provide communication"—and communication of the most direct, instantaneous and immediate kind between man and man that the world has ever seen. Yet the telephone is a link in the chain of development, which had its origin in the first courier who bore a letter or the first horse which bore a passenger between place and place. The road is followed by the railway, the railway by the telegraph, the telegraph by the telephone; but the new does not necessarily supplant but co-exists with the old. More letters are sent by post now that the telegraph and telephone render their signal aid to communication, just as more horses are employed by railway companies and their agents than were ever employed by any aggregation of coach owners and carters in the past before railways existed. Looking therefore on the telephone as *the* modern vehicle of communication (and a telephone message is but an oral letter delivered and replied to with the maximum of despatch), the origins of the post cannot fail to interest us.

To deposit a letter at the post office or drop it in a letter box, and find it safely delivered in due course to its addressee, seems so natural a proceeding and so much in the unalterable scheme of things, that we seldom pause to consider that the times are not so far distant when this indispensable convenience existed in a very limited form and the universal extension and dependability of the post was a consummation undreamt of. The word "posts" in itself suggests merely stations at which couriers were in readiness to carry the State despatches or the private missives of royalty; and the "post" in its earliest stages was nothing more. The establishment of posts along a route between two important towns was a costly matter to the State, and they were reserved for the king's letters.

The development of the post in all modern States seems to have proceeded on the same lines: viz., the establishment of a post route for State purposes, the admission of private letters on sufferance, the farming of the postal monopolies to private individuals, and finally the assumption of those monopolies by the State. LOUIS XI is said to have founded the French postal system in 1464; but, as our correspondent informs us, they were probably not for public use. HENRY VIII appointed Sir BRYAN (or BIRAM) TUKE, *Magister Nunciorum, Cursorum sive Postarum*, and this official forms an important landmark as the first Postmaster-General in England. About 1560 a legalised monopoly of letter carrying in Spain and Germany was established, and vested, as regards Germany, in the Counts of THURN and TAXIS. The rise of this celebrated monopoly is interesting. JOHANNES DAX (TAXIS) was *obrister postmaister* to the Emperor MAXIMILIAN I, maintaining posts chiefly for the service of the State and Court. PHILIP the HANDSOME, of Burgundy, made FRANZ VON TAXIS his postmaster in the Netherlands, and in 1500 a regular post was established between Mechlin in Flanders and Innsbruck in Austria. When CHARLES V became emperor, and the ruler of Spain, Naples and Sicily as well as Germany and Flanders, he found his huge empire divided by France, and regular communication between Spain and the Netherlands became of the utmost importance. The Taxis post system then assumed an international character; it existed in parts of Germany until 1866, and philatelists are familiar with the Thurn and Taxis inscription on early examples of postage stamps. The Prussian postal system was inaugurated by the GREAT ELECTOR, who established a government post between Cleves and Memel, the two extremities of his dominions. FREDERICK the GREAT largely extended it.

The *Zeitschrift für Post und Telegraphie* recently published some papers on an early post route between Prague, Pilsen and Klentsch, which are interesting as showing the personal and limited use of the royal posts of those days. This was an imperial and not a Taxis post route, and placed Prague in communication with Regensburg, Nuremberg and Frankfurt. The first record is a letter from FERDINAND I commanding certain salmon and lampreys to be sent promptly through the post that they might reach him, within a week at most, fresh and unspoiled for his daughter's marriage. The post offices on this route passed generally from father to son, the families of the postmasters (often belonging to the lesser nobility) intermarried, and the papers above referred to give a minute list of the DOROTHEAS, ANNAS, EVAS, KATHARINAS and MAGDALENAS they married and begat. Private letters were sometimes carried, generally by imperial favour, and, the writer thinks, free of charge.

When we learn with what difficulty, irregularity, expense and slowness the most important despatches of the State were conveyed a few hundred miles in the most cultured parts of Europe some three and even two hundred years ago, we are sensible of a very real and beneficial progress when we reflect that a private man of business may in these times be in Edinburgh and, for a few shillings, have his most important letters transmitted to him from London by word of mouth, and that he may, within a few minutes, dictate replies to them all before proceeding with his day's engagements. "By return of post" has come in most civilised countries to be synonymous, in a sense, with the day after to-morrow; but by "return of telephone" may mean anything from a few minutes upwards—no matter how great the distance.

The JOURNAL this month has been increased by four pages, and besides including a full report of the speeches at the Staff Dinner also contains reports of the proceedings of the Staff Transfer Association and of the consecration of the Telephone Lodge.

[*Drawn by* E. J. CLARKE, *Brighton.*

REGULATION DIFFICULTIES.

Foreman (*studying instructions for regulation of wires at different temperatures*): **"What is it, boy?"**

Boy (*with thermometer*): **"120 and a bit."**

HIC ET UBIQUE.

THE following is from the *Sphere*:—

A *salon de repos* has just been opened in connection with the chief telephone exchange in Paris, to be followed by others for the use of the women telephone operators and clerks. The strain of the service is very great, and the Under-Secretary of State for Posts and Telegraphs was of opinion that these "rest rooms," which are large and airy, with comfortable easy and rocking chairs, would serve the double purpose of keeping the operators in good health and so enable them to perform their duties better. There are a cloakroom and restaurant attached, at which latter meals are provided at a very moderate cost or in which the girls can eat their own food. The departure is such an excellent one that I commend it to the authorities in charge of our own Post Office and National telephone services.

If the *Sphere* wishes to recommend any further original excellent departures it might suggest to the North Western the desirability of running sleeping cars between London and Glasgow, or that the Midland should provide dining cars on their Manchester expresses.

THE canvasser in rural districts runs his man to earth in strange places. Our Chester correspondent (whose territory extends from the western parts of Cheshire to Anglesey) informs us that a contract officer recently canvassing for rural line orders obtained in one day four contracts under the following circumstances:—The intending subscriber in the first case was difficult to get hold of, and the agreement was signed on a bicycle seat in the middle of the road. The agreement for the second order, from a farmer, was signed on a pig's back in a pig stye. The third order was signed on a desk in an office, and the agreement for the fourth order, from a farmer, was signed on a calf's back in the middle of a field.

OUR Leeds correspondent forwarded an interesting black letter proclamation of Queen ANNE, 1703 (of which only four are known to exist, viz., the Crawford Collection, the British Museum, the Bodleian, and the Record Office), which unfortunately would not have been legible when reduced to a block of moderate dimensions. The proclamation ordained a general fast, the country having been ravaged by severe storms which were considered to be a divine visitation for its sins. "It is not inferred," says our correspondent, "that the Company's policy has ever merited the trouble caused by the many storms from which it has suffered."

OUR Liverpool correspondent sends us the following sample of Canadian telephone humour. The telephone borrowing nuisance—unfair alike to the subscriber and to the Company—although not unknown in Great Britain, does not seem to have attained the same proportions here as in America. It is one of the concomitants of the flat rate. The free telephoner feels that it costs his victim no more and effects the gratifying saving of a penny or twopence to his own pocket.

TELEPHONE ALWAYS OPEN.

1. Neighbours will kindly note the "number" of this telephone, and tell all their friends where *they* may be found.
2. This telephone is yours; we only pay the rent for it. "*It is more blessed to give than to receive.*"
3. If this 'phone is not in a suitable position we will have it altered.
4. Please scribble on the walls, as they need decorating.
5. Callers will kindly stand in line; and not wipe their feet, as it might spoil the door mat.
6. Long distance calls our speciality; kindly do not offer to settle.
7. Please do not destroy the telephone directory, as it and the Bible are the only books we own.
8. The Public Telephone at the corner Drug Stores is only a bluff. USE THIS ALWAYS.
9. Our family are prohibited from using the 'phone except between 6 and 7 a.m. Sundays.
10. These rules apply to everyone except you.
11. We would have placed this 'phone on the street pole, where it would be more convenient, but the Company object.
12. If this telephone is inadequate we will instal more.

THE Company's Chief Accountant for London desires to acknowledge the receipt of 6*d.* "conscience money" received with the attached letter.

Some time ago I went into several railway stations in London (some in the East End of London) and entered the telephone boxes and rang up the office—merely for a joke—giving numbers that I did not want; and I had no intention of speaking on the telephone. This being so I have to express my deepest sorrow and sincere regret for my conduct in this direction, and beg to assure you I have sincerely and humbly repented of my actions in putting the officials to needless inconvenience and trouble. I am enclosing sixpence in stamps as full restitution for any "wrong" I may have done then.

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from page 40.)

"Unfortunately, the wind now failed altogether, and the spectators on the quay saw with dismay that the *Duke of Montrose* was ceasing to cut the water, and lay with canvas hanging loose out of gunshot of *L'Imperial*. As quickly as this was perceived, however, hasty movements were seen on board, the boats dropped over the side, a dozen men leapt into them, and with a cheer which came faintly over the water to the ears of the merchants, and put some heart into them, the Falmouth men towed their ship towards the enemy.

"A short range was what Captain Dyneley wanted, his eight guns consisting chiefly of 12-pounder carronades, and he placed the *Duke of Montrose* within pistol-shot of *L'Imperial*. A very hot action then began. From the shore nothing could be distinguished but a cloud of smoke in which the two vessels were obscured. The *Attentive* was unable to attain a position which would enable her to give the Packet any assistance, and irksome as it must have been to her officers to see their convoy doing the work, she seems to have contributed nothing to the result—unless, indeed, it was her presence on the scene which restrained the other French vessels from interfering in the fight.

"If so, she rendered invaluable service, for Captain Dyneley had his hands full, and a very little would have inclined the scale against him. During three-quarters of an hour the fighting was desperate, but at last the English gained the upper hand. The smoke began to clear away and the people watching on shore saw the tri-coloured ensign drop from the mast and the Union Jack hoisted in its place. This was an excellent beginning, but the work was only half done, and Captain Dyneley, having taken possession of his prize, lost no time in giving chase to the *Napoleon*, which vessel appears to have been occupied chiefly in demonstrating how much faster than the *Attentive* she could sail, and in declining the action which the latter offered. In this prudent course she found no difficulty, but when the *Duke of Montrose*—an incomparably swifter vessel—bore down and offered fight, her crew flushed with the victory which had robbed the expedition of its most powerful component, the commander of the *Napoleon* judged that the time for Fabian tactics had gone past, and sought refuge in flight. Unfortunately for himself, he had delayed a little too long. Not only was the *Duke of Montrose* in a position whence she could have overhauled the *Napoleon* in a comparatively short space of time, but there were already in view, rounding a point of the coast, the white sails of an English cruiser, which, attracted by the firing, was running down to see if she could be of use. Captain Dyneley continued the chase long enough to assure himself that the newcomer, which proved to be H.M.S. *Wasp*, Captain Bluett, could not miss the *Napoleon*, and then returned to Rozeau Bay where he found the circumstances completely changed. The *Attentive* had succeeded in capturing the row-boats, and as the *Duke of Montrose* re-appeared on the scene of action had just scuttled them. There remained only one vessel of the whole flotilla, and about this one it was unnecessary for either the *Attentive*, the *Duke of Montrose*, or the *Wasp* to concern themselves. For the apprehension of a conflict on shore was no sooner removed by the capture of *L'Imperial* than the soldiers who were in charge of the land defences became impatient of their inaction, and Lieutenant Hamilton, having obtained leave, manned a couple of boats with soldiers of his own, the 48th, regiment, pulled out to the French ship, and captured her after a brief encounter. Thus of the whole expedition not one ship or man escaped; and an hour's energetic action had turned the well-founded apprehensions felt for the safety of Dominica into security. Captain Dyneley was undoubtedly the saviour of the island. Had he not checked the course of *L'Imperial*, that vessel, which doubtless carried General Hortade, would have executed her plans without impediment. The *Attentive* could not overhaul her; the *Wasp* was too far away to be of use in preventing a landing. Had the French troops been disembarked there must have been desperate and bloody fighting, the result of which could not be forecast. The loss of property would have been immense, the discredit to England and the loss of prestige in the West Indies would have been greater still.

"Whether the merchants expressed their acknowledgments to Captain Dyneley in any form is not recorded in the official papers from which these facts are drawn; but General Dalrymple in his despatch to the Admiralty stated the case not unfairly, though it cannot be said that he wrote with any undue appreciation of the services of the Post-Office commander. He admitted that the capture of the two most formidable ships in the hostile flotilla was due, the one directly and the other indirectly, to Captain Dyneley's enterprise and pluck; and added, 'His zeal and disinterestedness are highly commendable, as from his instructions he had a good deal to lose.'

"This is only one of many gallant fights won against disheartening odds, and the annals of the Packet Service are worthy of every Englishman's perusal."

As in naval warfare so on land, Post Office officials have played their part nobly. Here is a relic of the writing from the wall of the "Chamber of Blood," Cawnpore, where our women and children were massacred. The mystic symbols can be read by the initiated. (Illustration in next column.)

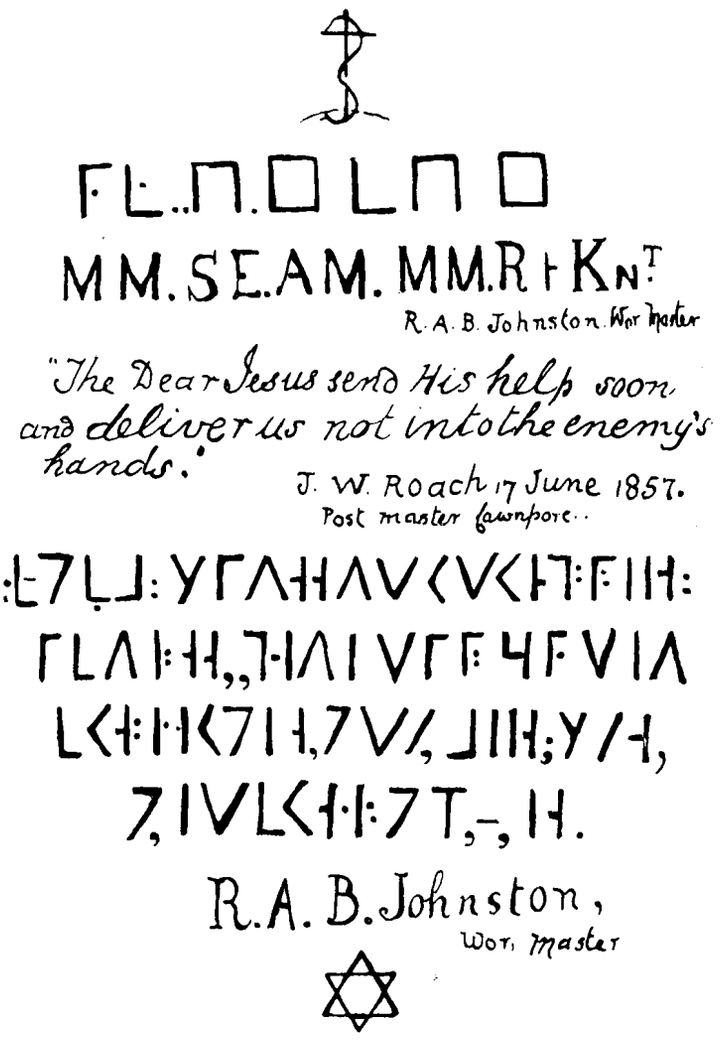
In 1659 John Hill, an attorney, published a pamphlet, *The Penny Post*. He placed relays of horses on the road between London and York, and aimed at establishing a Penny Post for England, a Twopenny for Scotland, and a Fourpenny for Ireland, but was very early severely dealt with, and his carriers forcibly put down by the soldiers of Cromwell.

During the latter part of Cromwell's time, the revenue of the Post Office was farmed to a Mr. John Manley for £10,000 per annum, who when relinquishing in 1659 calculated he had cleared £14,000 per annum; when Henry Bishop was appointed Postmaster-General at the Restoration, he undertook to pay £21,500 per annum.

The agreement with Manley sets out the powers of the Post Office, and the present monopoly was virtually first established by it, for instance:

"The said John Manley shall have the sole Care and Charge of the Postage and Carriage of all Letters and Packets, both Foreign and Inland to and from all persons; and in all places of England, Scotland and Ireland, and to and from all other places within the Dominions of this Common-wealth, exclusive to all others, except for such as shall be sent either by common and known carriers along with their Carts, Waggons or Pack-horses, or by Messenger or Messengers on purpose, or by some servant, or friend or friends, or by some Ship or Ships, Vessel or Vessels, and Boats to carry Letters (except only such as shall be imployed by the said John Manley, together with all other Posts, but such as shall likewise be thereunto Authorized and impowrd by him) are hereby expressly prohibited, forbidden and suppressed.

"Item, That for all other Letters and Packets to or from private persons, and for private occasions (and not at all relating to the persons and publique


R.A.B. Johnston. Wor Master
"The Dear Jesus send His help soon and deliver us not into the enemy's hands."
J. W. Roach 17 June 1857.
Post master Cawnpore.
R.A.B. Johnston,
Wor. Master

Affairs mentioned in the former Article being absolutely free from Fee and Postage) he the said John Manley shall by himself, his Agents, Deputies, or under Officers receive and take for the carriage and Postage thereof only according to the Rates following, and no other or higher rates, viz.—for every Letter to or from any place within eighty miles distant from London, if a single Letter, two pence, and if a double Letter four pence. And for every Letter at a farther distance than eighty miles, if a single Letter three pence, if a double Letter, six pence. And for every Letter to or from Scotland, if a single Letter, four pence, if a double Letter, eight pence. And to or from Ireland, for every single letter, six pence, and every double letter, twelve pence, and for treble or greater Packets of Letters proportionably."

The statute 12 Charles II, c. 35, re-enacted the ordinance of Cromwell, and is known as the Post Office Charter. It remained in force till 1710. Bishop was dismissed in March, 1663, and Daniel O'Neale, a Groom of the Bedchamber, was Postmaster-General for seven years until 1670.

In 1663 the Turnpike Act was passed, and provided for improvements which were certainly very necessary. John Manley was obliged "to cause the said Posts to run seven miles an hour in Summer, viz., from the first of April to the last 01 September; And five miles an hour in Winter, viz., for the rest of the year"; but

the post-boys were not above suspicion, and the following caution was issued :—

CAUTION to POST-BOYS.

BY the Act of 5th of *Geo.* III. If any Post-Boy, or Rider, having taken any of His Majesty's Mails, or Bags of Letters, under his Care, to convey to the next Post Town or Stage, shall suffer any other Person (except a Guard) to ride on the Horse or Carriage, or shall Loiter on the Road, and wilfully mispend his Time, so as to retard the Arrival of the said Mails, or Bags of Leters, at the next Post Town or Stage.—Every such Offender shall, on Conviction before One Justice, be committed to the House of Correction, and confined to hard Labour for one Month. All Post-Boys and Riders are therefore desired to take Notice of this, and are hereby cautioned not to fail in the regular Performance of their Duty, otherwise they will most assuredly be punished as the Law directs. And it is hoped and requested, for the Benefit of public Correspondence, that all Persons, who may observe any Post-Boy or Rider, offending as aforesaid, will give immediate Notice to Johnson Wilkinson, Surveyor of the General Post-Office.

The following is perhaps interesting in conjunction with the Caution to Post-Boys :—Robert Reade, writing to Charles Spellman on the 3rd Feb., 1661, complains that he has received no commands, and does not wonder at it "because the flying post lay drunke last Friday at Fakenham (being the day he should have binn at Thetford to take those letters then there which he should bring hether on Saturday) and had not changed his quarter yesterday as I am informed by one of Scott's men who saw him pitty fully drunke."

The word "flying" was no doubt used in the sense of running.

The varying rates of postage are interesting, for as early as 1695 the postage from London to York for a single letter was 3*d.*; in 1813, 11*d.*

In 1695 a circuitous route would be diverted into a direct one, even though the shorter distance meant less postage; in 1813 a direct post was being constantly refused on the plea that a loss of postage would result.

In 1779 one of the greatest Post reformers, John Palmer, rose to notice; he quickened the post-boys to ride five miles per hour. This does not sound prodigious in the days of motor-cars, but when Prince George of Denmark went from Windsor to Petworth to meet Charles III of Spain he was fourteen hours in doing forty miles, although, except when overturned or stuck fast in the mud, he made no stop during the journey. This gives us a pitiful picture of the state of the roads of the period.

But we were to have blind old Metcalfe, Macadam, and Telford to work improvements, and it was possible in 1754 for a party of merchants to start what they called a Flying Coach from Manchester, soon followed by Leeds.

The first mail coach from London to Leeds ran on the 25th July, 1785.

Palmer here came to the front, and worked wonders, although opposed to the unbelievable extent that it was officially stated by Chancellor Campbell: "Many instances were supplied to him of passengers who had died suddenly of apoplexy from the rapidity of the motion of Palmer's Mail Coaches."

The first coach was introduced into Ireland in 1790.

I illustrate an old coach time bill; it is addressed to T. Urquhart, the Surveyor of the General Post Office.

In 1821 Henry Burgess, of Miles Lane, London, proposed extra Posts or Express Letter Cars, to be of very light construction and drawn by 2 horses and to travel 11 to 11½ miles an hour. In the official reports which I have, a mass of very valuable information is given regarding the existing mails to Leeds, Manchester, Liverpool, etc., and I have a very old Yorkshire carrier's time table showing the times of mails and waggons leaving Ferrybridge and other towns.

On the following page are two interesting notices *re* the Robbery of the Mail, 5 Dec., 1798.

The following is an original notice I have, *re* the Robbery of the Leeds Mail, 1812 :—

"General Post Office, Tuesday, 27th October, 1812.

"About 7 o'clock on the Evening of Monday, the 26th instant, the LEEDS Mail-Coach was robbed of the Bags of Letters for London, described at Foot, between Kettering and Higham Ferrers, and within 3 miles of Higham Ferrers, by forcing the Lock of the Mail Box.

"The Bags stolen are :—

Halifax	of the 25th.	Chesterfield	of the 25th.
Bradford	,,	Mansfield	,,
Leeds	,,	Nottingham	26th.
Wakefield	,,	Melton Mowbray	,,
Huddersfield	,,	Oakham	,,
Barnsley	,,	Uppingham	,,
Sheffield	,,	Kettering	,,
Rotherham	,,	Thrapstone	,,

"Whoever shall apprehend the Person or Persons who committed the said Robbery, will be entitled to a Reward of

TWO HUNDRED POUNDS,

one Moiety to be paid on Commitment for Trial, and the other Moiety on Conviction. If an Accomplice in the Robbery will surrender himself, and make Discovery, whereby one or more of the Persons concerned therein shall be apprehended and brought to Justice, such Discoverer will be entitled to the said Reward, and be admitted on Evidence for the Crown.

"By Command of the Postmaster-General.

"F. FREELING, Secretary."

Four months later we have a description of the "knight of the road" who was supposed to have committed the robbery :—

"General Post Office, February 9th, 1813.

"200 POUNDS REWARD.

"WHEREAS

"HUFFEY WHITE is strongly suspected to have been concerned in the Robbery of the Leeds Mail, between Kettering and Higham Ferrers, on Monday Evening, the 26th of October last; whoever shall apprehend, or cause him to be apprehended, will be paid a reward of ONE HUNDRED POUNDS upon his Commitment for Trial, and the further Reward of ONE HUNDRED POUNDS upon his Conviction.

"By Command of the Postmaster-General,

"FRANCIS FREELING, Secretary."

General Post Office, Dublin.

EARL OF LICHFIELD, Postmaster-General

Belfast and Donaghadee Time Bill.

DAILY MAIL CAR.

Distance from Dublin to Belfast 80½	Irish Miles. M.	F.	English Miles. M.	F.	Time allowed. H.	M.	No. of Passengers.	
								Mail Coach from Dublin arrived at A.M. H. 2 M. 35
								Do. from Derry arrived at A.M. 7 20
								Do. from Enniskillen arrived at A.M.
								Despatched from Belfast at A.M. 6 —
								the 9 day of Oct 1839
								Postmr.
John Grogan, Contractor. Newtownards 88	7	7	10	0	1	10		Arrived at Newtownards at .. 10 15
								Postmr.
Donaghadee 94⅜	6	3	8	1	1	0	4	Arrived at Donaghadee at .. 11 10
								Postmr.
	14	2	18	1	2	10		Mail Despatched to Packet at 11 20
								RETURN.
With a Sack to Belfast containing 4 Bags								Packet arrived at .. 11 55
								Despatched from Donaghadee at M.
								the 10 day of Oct 1839 12 — 3
								Postmr.
Newtownards	6	8	8	1	1	0	3	Arrived at Newtownards at .. 1
								Postmr.
Belfast ..	7	7	10	0	1	10	4	Arrived at Belfast at .. 2 13
								In time for the Despatch to Dublin.
	14	2	18	1	2	10		Postmr.

When any material Loss of Time occurs, the Deputy is to write the Cause of it upon the Time Bill.

The Time must be punctually observed, and the Bills correctly dated. On any particular irregularity happening, the Bill to be sent by the *first Post* to me, the others by every *Monday's Post*, and *One Month before they are expended, Notice to be given*, and one enclosed to me. If they are misapplied, and it should be necessary to reprint them before Twelve Months, it will be done at the Postmaster's expense.

P. URQUHART,
Surveyor of the General Post-Office

384—September, 1839.

In 1814, S. Richardson was paid £50, for evidence against Huffey White, T. Parkinson, £150, and J. & R. Limbrick, £50, for apprehending.

Nowadays it seems curious, but it is on record that Caldwell who robbed the Edinburgh to Glasgow Mail in 1736 was after his sentence as the accounts show—

"By cash to Caldwell himself after receiving sentence of death, the Lords of Justiciary having recommended for the bench to give him the same upon receipt £5 6s. 0*d.*"

On April 19th, 1751, the following was issued :—

"General Post Office, April 19, 1751.

"Whereas the Post-Boy bringing the Cirencester Mail to this Office, was Yesterday morning, between Two and Three o'clock, on Garrard's Cross Common, between Wickham and Uxbridge, attacked and robbed, by a single

Highwayman, mounted on a Bay Mare, who carried off the said Mail, which contained the following Bags of Letters, viz. :—

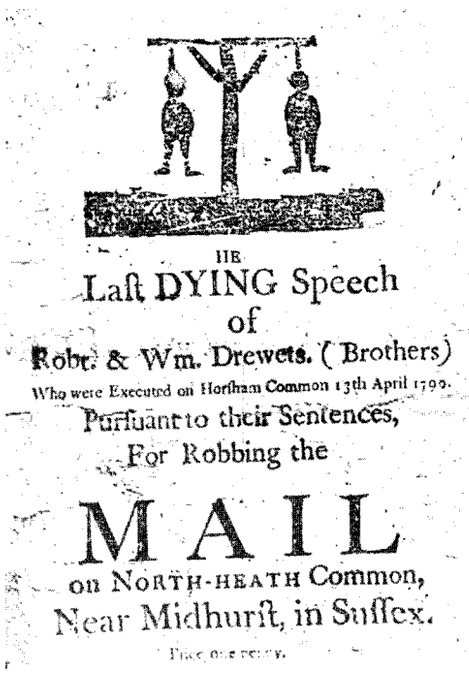
Bristol,	Worcester,
Exeter,	Wolverhampton,
Tiverton,	Woodstock,
Taunton,	Bath,
Wellington,	Gloucester,
Wells,	Thame,
Oxford,	Wickham,
Burford,	Beconsfield,
Witney,	Garrard's Cross,
Chippingnorton,	Abingdon,
Camden,	Faringdon,
Evesham,	Etc.

"The Person who committed this Robbery was a tall lusty black Man, about six Feet high, between Forty and Fifty Years of Age, marked with the Small Pox, and had on a blue Surtout or Horseman's Coat, and under it a dark colour'd one, with white Metal Buttons, and wore a black or dark colour'd Wig, and rode upon a large Brown Bay Horse or Mare, Fifteen hands high, with a bald Face, and a dark black Mane, the Tail lately dock'd and nick'd, the Wounds not healed.

"This therefore is to give Notice, that whoever shall apprehend and convict, or cause to be apprehended and convicted, the Person who committed this Robbery, will be entitled to a Reward of Two Hundred Pounds, over and above the Reward given, by Act of Parliament, for apprehending of Highwaymen: Or if any Person, or Persons, whether Accomplice in the said Robbery, or knowing thereof, shall make Discovery, whereby the Person who committed the same, may be apprehended and brought to Justice, such Discoverer, or Discoverers, will, upon Conviction of the Party, be entitled to the same Reward of Two Hundred Pounds, and also have His Majesty's most gracious Pardon.

"By Command of the Post-Master General,

"GEORGE SHELVOCKE, Sec."


THE
Laſt DYING Speech
of
Robt. & Wm. Drewets. (Brothers)
Who were Executed on Horſham Common 13th April 1799.
Purſuant to their Sentences,
For Robbing the
MAIL
on NORTH-HEATH Common,
Near Midhurſt, in Suſſex.
Price one penny.
Robert and Wm. DREWETS, (Brothers) were born near Midhurſt in Suſſex, of Poor, but honeſt parents; it being out of their power to give them but little education, having ſo large a family.—Poor unhappy Men! they learnt nothing but Vice: Willm. being the eldeſt brother always took the lead in his wicked actions, but at length the hand of Juſtice overtook him and put an end to his wicked actions.
He has left a Widow, and ſix ſmall children.
When young men begin to run aſtray,
The law of God is by them done away.
Robert being the younger Brother and daily with William, gave way to the advice of his Brother, by which he met with his unhappy end.
The hour arrived which was to put an end to the lives of theſe unhappy Criminals, they received the Sacrament, and after which they were placed in a cart and conducted to Horſham Common:
At the Gallows, Wm. declar'd his innocence, and hop'd that the Spectators would take a warning, and not Hang People wrongfully:—
Beware in youth, of their unmmely fate,
And turn to God before it is too late;
Be not inſtic'd to unlawful gain,
That was the cauſe of their unhappy end,
Live honeſt and juſt, & you'll be,
Rewarded to all eternity.
After hanging the uſual time, their Bodies were convey'd to the place where they committed the Robbery to be Hanged in CHAINS.

General Poſt-Office,

Thurſday, 6th December, 1798.

THE Poſtboy, carrying the Mail from Petworth to Haſlemere, was ſtopped at a Place called North Heath, about two miles from Midhurſt and ſix from Haſlemere, between Seven and Eight o'Clock laſt Night, by two Men on Foot, dreſſed in White Round Frocks; one of them took hold of the Horſe and threatened to blow the Boy's Brains out, if he was not quick in unſtrapping the Mail.

The Robbers took away the Bags of Letters ſent from Arundel, Petworth and Midhurſt, of the 5th Inſtant, for London.

Whoever ſhall apprehend and convict, or cauſe to be apprehended and convicted, both, or either of the Perſons who committed this Robbery, will be entitled to a Reward of TWO HUNDRED POUNDS, over and above the Reward of FORTY POUNDS for each Perſon, given by Act of Parliament for apprehending Highwaymen: Or if any Accomplice in the Robbery, or knowing thereof, ſhall ſurrender himſelf, and make Diſcovery, whereby both, or either of the Perſons who committed the ſame, may be apprehended and brought to Juſtice, ſuch Diſcoverer ſhall be entitled to the ſaid Reward of TWO HUNDRED POUNDS, and will alſo receive His Majeſty's moſt gracious Pardon.

By Command of the Poſtmaſter-General,

FRANCIS FREELING,
SECRETARY

And the following would appear to apply to the above :—

"General Post Office, London, March 17, 1753.

"WHEREAS a Person of about six feet high, fifty years of age, of a swarthy complexion, much pitted with the Small-Pox, and wore a darkish coloured Coat, and a brown bob Wig, came last Night, about Six o'clock, to the Shop of Mr. Thomas Harding, Goldsmith, in the Minories, and bought of him a straight-bodied Silver Tankard, Weight, 25 oz. 16 dwt., with the Letters C.D. marked, by his Desire, on the Handle thereof; and the said Person having given, in payment for the said Tankard, a Bank Post Bill, which was taken out of the Cirencester Mail, which was robbed on the 18th of April, 1751, and indorsed the said Bank Post Bill by the Name of Charles Dew.

"This is therefore to give Notice to all Goldsmiths and Others, to whom the said Tankard may be offer'd in Sale, that whoever apprehends, or causes to be apprehended, the Person above described, who is strongly suspected of having been a Principal, or an Accomplice in the said Robbery, shall, upon Conviction, be entitled to a Reward of Two Hundred Pounds, over and above the Reward given by Act of Parliament for apprehending of Highwaymen.

"By Command of the Post-Master General,

"GEORGE SHELVOCKE, Secretary."

"General Post Office, Oct. 18, 1753.

"WHEREAS an anonymous Letter has been sent to the Right Hon. Thomas Earl of Leicester, his Majesty's Post-Master General, in the following Terms :—

"My Lord. 1753.

"I find that it was by your Orders, that Mr. Stockdale was hung in Chains; now, if you don't order him to be taken down, I will let fire to your House and blow your Brains out the first opportunity.

Thursday, Oct. 11th.

"To the Right Hon. the Earl of Leicester,
at Holkham, Norfolk.

"This is to offer a Reward of One Hundred Pounds to any who shall or may make Discovery of the Party or Parties concerned in writing or sending the above-said Letter, so that he, she, or they, be convicted thereof; together with his Majesty's most gracious Pardon for any Accomplice who shall make Discovery of the same.

"By Command of the Post-Master General,

"GEO. SHELVOCKE, Sec."

John Barrett was the last man hanged for any Post Office Crime, on 13 Feb., 1832, for stealing letters.

In 1675, Charles II, an Act for settling the profits of the Post Office, and a power of granting wine licences, on the Duke of York and his heirs, in perpetuity, was passed, since when the Crown have retained the right.

(To be continued.)

NEWCASTLE-ON-TYNE THRIFT CLUB.

THE first annual meeting of the thrift club was held on Dec. 12, 1907. The hon. secretary read a report showing that 55 operators had become members while ten had withdrawn, chiefly due to operators leaving the service. The total membership on Nov. 20, 1907, was 45, the amount deposited being £166 3s. 9d., the amount withdrawn £91 19s. 1d., leaving a balance due to depositors of £74 19s. 9d. The meeting expressed satisfaction with the success of the venture, and the committee and officers for ensuing year were elected.

SOME NOTES ON UNDERGROUND PLANS AND RECORDS.

BY JOSEPH V. ELLIOTT, *Engineer, Mid Lanark.*

IN laying down the Paisley new underground system on the 25-inch maps, the routes of the ducts were shown by the usual coloured lines, but when the question of pasting on the maps sketches of the positions of cables in ducts, positions of chambers, split pipes, etc., came to be considered, it was at once apparent that some other method would have to be adopted to ensure clearness and certainty of the records.

Owing to the peculiar street formation, and the local engineering difficulties in the immediate vicinity of the exchange, the openings required for manholes, chambers, etc., were so numerous that the map would have been practically obliterated by the sketches.

Further, the sketches (except in a few instances) would not have been placed in their proper positions, and this would have necessitated the use of long arrow-headed lines, which is a method to be avoided whenever possible.

It was therefore decided to adopt the following method:—

From the exchange, the four main routes were called the north, south, east and west sections. Standing on the north section from the exchange, the various gaps were taken in consecutive order, and numbered for map purposes, as follows (Fig. 1):—

Exchange chute chamber	C.1
12 High Street chamber	C.2
12 High Street manhole	M.1
100 „ „ „	M.2
Moss Street corner manhole	M.3
County buildings manhole	M.9
„ „ straight split	S.1

and so on, to the end of the north section, the various side branches being dealt with after the main route.

(*Note*:—M denotes manhole; C brick chamber: S split pipe.)

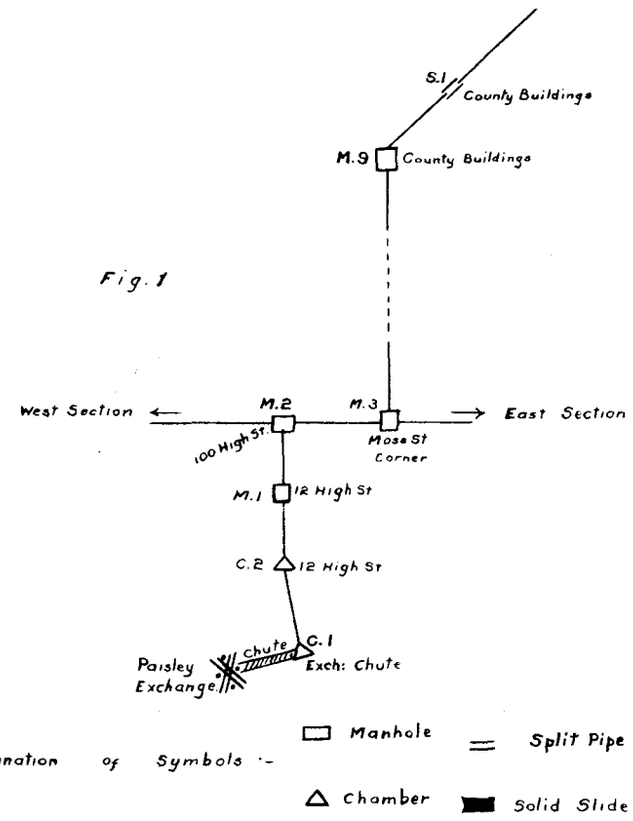


Fig. 1

The south section gaps were then numbered from the exchange outwards in the same way, followed by the east and west sections. (It was not thought desirable to use a fresh series of numbers for each section, therefore, as M.9 was the last manhole in north section, the first manhole in south section became M.10, and so on.)

It was next necessary to fix the allotted numbers on the maps. Gum and paste are both rather messy, besides taking some little time to dry properly. I found that a penny packet of gummed covers for jam pots met the want exactly. The numbers were typewritten across the gummed paper in their proper order, and afterwards cut out in little pieces of about $\frac{1}{8}$ inch by $\frac{1}{4}$ inch. These pieces were then stuck on the map in their proper positions, with the result that the map was not at all obliterated, and the route is, if anything, more distinctly shown by the lines of small white patches of paper.

A note book (Schedule No. 513) was taken, and all plans and sketches entered in it in a certain definite order, the precedence of the various main routes again being north, south, east and west. The jam pot covers were again used to provide a duplicate set of numbers to fix against each sketch in the book.

The following explanation of the scheme of the book was typewritten and pasted on the first page:—

The diagrams, etc., in this book are arranged in the following order:—

(1) MANHOLES (M.1 to 33).
"Plan" and "Section" diagrams are given for each manhole, on a rough scale of $\frac{1}{24}$th (1 inch = 2 feet; $\frac{1}{8}$ inch = 3 inches).

(2) CHAMBERS (C.1 to 45).
"Plan" and "Section" diagrams, followed by a rough street sketch with measurements to locate chamber readily.

(3) SPLIT PIPES OR BENDS (S 1 to 164).
SOLID SLIDE PIPES (SL.1 to 3).
Note.—The numbers (M.1, C.45, S.72, SL.3, etc.) correspond with the numbers gummed along the route lines on the Paisley 25-inch maps.

(4) SYMBOLS USED FOR DUCTS.

(5) MILEAGE AND CABLE DUCT DETAILS—North, south, east and west sections.
Note.—The ducts are shown in every case as if looking FROM the exchange.

(6) LIST OF DISTRIBUTING POLES.

"Plan" Sketch of Manhole

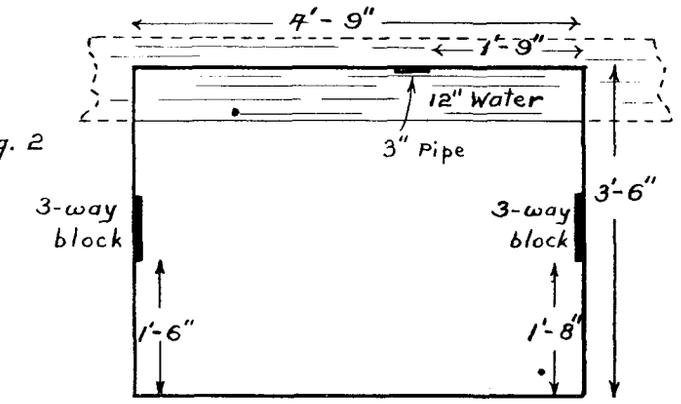


Fig. 2

"Section" Sketch of Manhole

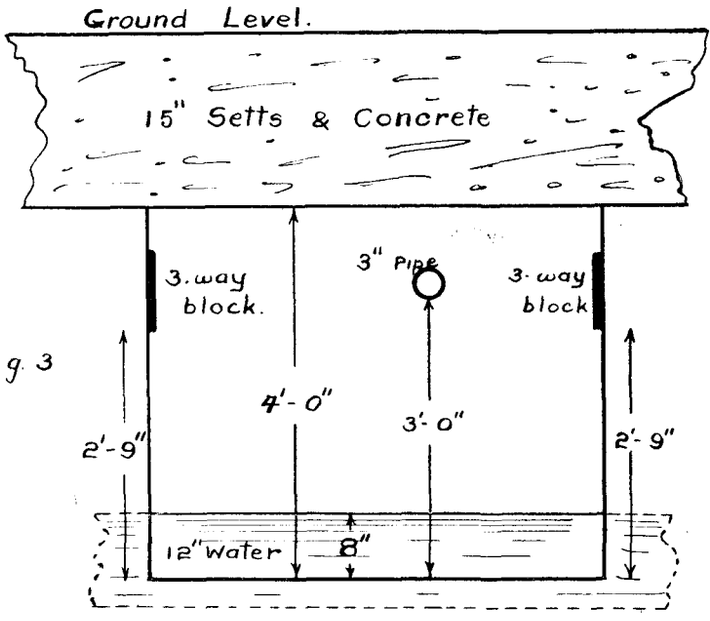


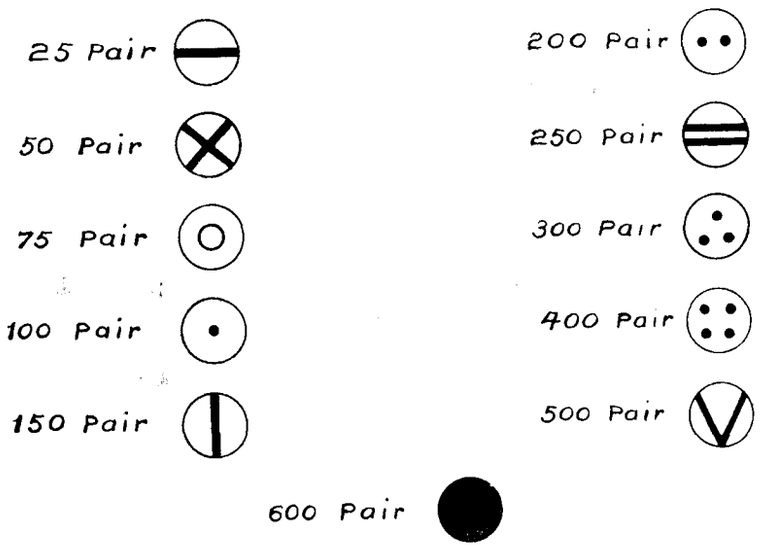
Fig. 3

Manhole sketches were made up on the following lines (see Figs. 2 and 3) :—

"Plan" sketch.	"Section" sketch.
Length.	Class of roadway and depth to flag cover.
Width.	Depth (roof to floor).
Pipes entering, with clearance from side or end of manhole.	Pipes entering, with clearance from floor of manhole to bottom of duct.
Any foreign pipes, with sizes (external diameter).	Any foreign pipes.

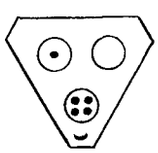
SYMBOLS USED FOR DUCTS.

I believe there is no recognised set of symbols for indicating readily the size (in pairs) of cable in a duct, so the following set was made up, and will I think be found easy to memorise :—



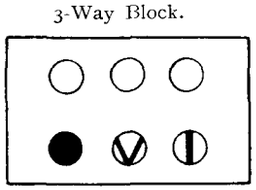
The hundreds (from 100 to 400) are indicated by a corresponding number of dots inside the circle which represents the duct; thus three dots indicate a 300-pair cable; 500 is represented by the Roman numeral "V," while 600, being the limit of capacity at present, is shown all black, that is, "full up."

The following examples will illustrate the graphic simplicity of this method :—



Three-way block-with 400-pair cable in bottom duct, and 100-pair in top left duct.

3-Way Block.

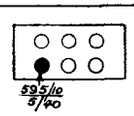


Six-way block, with a 600-pair, 500-pair, and 150-pair, in the three bottom ducts (reading from left to right).

6-Way Block.

MILEAGE AND DUCT DETAILS.

Two examples of these entries are given below :—

From	To	Yards	
Test Room	13 High St. Chambers	26	 595/10 5/90
Johnston St Manhole	Gordon St. Manhole	116	498/10 2/90

The figures shown against duct sketches indicate that the 600-pair cable contains 595 pairs of 10-lb. conductors and 5 pairs of 40-lb.; while the 500-pair cable has 498 pairs of 10-lb. and 2 pairs of 40-lb.

The "List of Distributing Poles" gives the following particulars, with a summary for ready reference :—

GROUND POLES.		ROOF POLES.	
Position of distributing poles.	Size of cable (pairs).	Position of distributing poles.	Size of cable (pairs).
George Place ..	50	Gordon Street ..	50
Orr Street ..	50	Espedair ..	100

SUMMARY.

Size of cable (pairs).	Ground.	Roof.	Total.
25			
50			
100			
Totals ..			

The advantage of having all the foregoing information grouped together seems undoubted. All requisite details (positions and particulars of all openings in route, positions and sizes of cables in ducts, etc.) are contained in a handy-sized book, which can be carried in the pocket and consulted at any moment regardless of weather (for there is always a house passage or other shelter at hand).

On the other hand, 25-inch maps are inconvenient articles to consult, even in the best of weather, and in wet weather the consequences are often likely to be disastrous.

Any alteration which may involve new sketches can easily be made to the pocket book by taking out the leaf affected and gumming in a fresh one.

As underground work is becoming so general now, it would be very interesting to have the various methods of making up plans and records used at different centres during the different stages of the work. Without any prejudice, I am led to believe that the Edinburgh centre could furnish some valuable information and specimens of plans, and once interest is aroused in the matter the exchange of views would probably lead to standard methods being evolved.

PRACTICAL ECONOMY.

BY F. W. ROBERTS, *Local Manager, Brighton.*

CONSTRUCTION.

THE high costs of particular works done are not always found to be due to any laxity on the part of the men actually employed, but often to circumstances arising over which the staff have no control. More often than not, however, excess expense is caused through the work being badly planned and supervised; one hour's, or even half-a-day's careful thinking out all the details to arrive at the best and most economical way of carrying out a job, will assuredly result in a saving of money. This procedure ought to be a *sine qua non*, but experience shows that it is not always so. An engineering inspector is expected to inspect the work done by supervising at intervals, but his first thoughts—and they will undoubtedly be the most interesting ones—should be how to carry out the work in the best and quickest way, and to arrive at this decision he should, metaphorically speaking, see the job finished in every detail before it is started. It is not so much a question of supervising the men as it is of supervising the arrangements. "Look ahead and think," should be the motto: for example, a pole or two extra round a bend on a route will save line faults and money in maintenance.

Getting the gangs away from the stores promptly each morning is a start in the right direction, and there should be sufficient men in the stores at the time to enable this to be done effectively, calling one or more reliable men from the gang if necessary to hand out stores, this being done under the supervision of the store-keeper.

If records are kept of standard costs, such as the average cost of running subscribers' lines, erection of cable, suspender wires,

jointing, then on any specially high cost being noted careful investigation might result in the cause being traced, and remedies adopted for future jobs. Such records will be found to have more than a passing interest; apart from their value as records for the purpose of estimating. Further, a good record of costs will save a lot of thought and time when making up estimates.

The cost of wayleaves will provide some interesting figures. Taking a record of eight men from Jan. 10, 1907, to May 16, 1907, it was found the actual cost of the consent obtained dropped from 6·9*s*. to 3·8*s*. and the actual cost of a pole, bracket or stay obtained, from 8·6*s*. to 4·36*s*.

These figures are the result of a special record kept to show the work done by wayleave officers.

The time that it takes to connect up new orders should receive close attention; the immediate results will vary according to the thought that has been bestowed at some previous date on the cable plant provision.

MAINTENANCE.

If close attention is paid to the monthly cost of line repairs and instrument repairs, and the causes of any increase traced, such scrutiny will no doubt eventually point the way to effect reductions. It is not of any great advantage to compare the cost of one centre with that of another, because there are so many circumstances that may affect particular cases. The object is to economise with efficiency.

All fault reports should be scrutinised for a period, and from this scrutiny trouble may be traced to bad construction, and remedies applied to prevent regularly recurring faults.

The condition of tools is often a source of expense. Sometimes it is better to scrap a tool than pay for its repair; sometimes it is better to have it repaired; it is all a question of cost, but the point should receive close attention. Tools are often spoilt for want of the proverbial "stitch in time."

If I may suggest it, the extent to which inspections on common battery systems should be carried is a point which should receive careful consideration; it is almost a question whether direct lines without extensions should be inspected at all, since the lines are practically permanently under test; more frequent speaking tests might suffice.

CLERICAL.

During the year there are many accounts made out for small purchases for 6*d*. and under, and these are passed through the weekly expense sheets—sometimes as many as twenty to thirty a week. Now, if they are passed through separately they cause endless work, whereas if they are entered on the back of a No. 35 form, the work as far as the office is concerned is reduced to one voucher.

A price-book of costs and charges will prevent overcharges by local tradesmen, and no account should be certified without enquiring whether the expense was absolutely unavoidable. Of course, what has happened cannot always be altered, but the future can be provided for.

The use of codes and numbers or abbreviations for describing things will all effect saving in time.

Many of us observe that a visit from an auditor generally brings with it a crop of enquiries, but these can be greatly reduced, and everybody's time saved, if a systematic and careful scrutiny of the works order is made as soon as the cost slip has been written up, by putting on the cost slip the necessary notes that will explain any point likely to be raised. In fact you require to consider yourself an auditor for the time being.

These are only a few of the many ways whereby practical economy can be effected, but there is one department where I am of the opinion that much economy could be effected, and that is in the stores. On the surface it hardly seems necessary to exercise such minute accuracy in the booking out of special stores (almost unsaleable), such as S.I. cups, bolts, etc. Why not book out at the beginning of each month say 200 S.I. cups for N. works orders, and put these aside in a special bin, instead of booking out in detail all the small quantities it is necessary to issue on various N. works orders? If only one dozen accounts of this nature were so treated there is little doubt that a large saving in office work throughout the whole of the country on the part of foremen and stores clerks would be effected, and very little otherwise sacrificed.

TELEPHONE WORK IN SOUTH AFRICA.

BY A. CYRIL JENNINGS, *Cairo*.

As an old "National" man and a constant reader of the JOURNAL, it was suggested to me when last in London that perhaps a short article on the above might be of interest.

The particular work about to be described consisted of the erection of about 50 miles of overhead route for the Port Elizabeth Municipality. Like most other South African towns, Port Elizabeth required a good water supply, the existing one not being sufficient to meet the demand. The only available sources of supply were three mountain rivers about 40 miles from the town. The scheme involved the construction of two huge masonry dams, to impound about 400,000,000 gallons of water and lead it by means of steel pipes into the town by gravitation. The reservoirs were to be built right away in the mountains far from railways and telegraphs, so it was decided that a telephone line should be erected which should follow the course of the pipe line and join up all the various parts of the works, at the same time affording an easy means of communication for workmen along the track to get into touch with headquarters.

The poles were of the wrought tubular type, fitted into cast-iron bases and tapering to the top; the wire was of No. 14 copper, the insulators of porcelain, and the brackets of galvanised iron. It is almost impossible to use wood poles in South Africa; in the first place there is little or no local supply of good straight poles. Secondly, they are attacked by ants and other insects, and are more bulky and difficult of transport than iron ones.

It was decided to start the line from the distant end at Sand River, and for the first 22 miles the country was exceptionally rough. In many places roads had to be cut through the bush before work could be started. The only means of transport was by bullock wagon. These are slow and somewhat cumbersome, but excellently suited to South African roads. The material was brought as near to the track as possible by the wagons, and carried on the shoulders of natives for the remainder of the way.

The natives employed were Kaffirs, of which there is usually a good supply at a wage of about 2*s*. 6*d*. per day. They are good workmen when well looked after, but of course are not slow in taking a "rest" whenever an opportunity presents itself. The poles in many cases had to be carried up steep mountain sides, covered with loose boulders, through rocky gorges and across rivers, and the work was slow, tedious, and exceptionally hard at times. The men were arranged in three gangs, each with two or three Europeans and about 30 natives. The first were ahead cutting bush, carrying poles, moving camps, etc.; the next excavating holes and erecting poles; and finally, came the wiring party, whose duty it was to see that the whole route was left complete.

Great care must be taken in regulating the wire in these hotter climates, owing to the range in temperature between early morning and midday, often varying between 55° and 90° F. in the shade. I have often seen ice outside my tent in the early morning, and then the sun at lunch time has been almost overpowering. The men all lived in tents. This is very pleasant except in the rainy season, when it sometimes rains for days almost without a break. The experience of camping on the South African veldt is a never-to-be-forgotten one, especially away in the bush, where the deathlike stillness of a bright moonlight night is only broken by the howl of a distant baboon or jackal, or the cry of a bush buck.

After the difficulties of the first twenty miles were overcome the line entered level country. It was then important to erect the poles in the straightest possible lines, which often run for five or six miles in a dead straight line, so that one pole covers the whole route. It was the general practice to erect about twenty poles to the mile in level country, and about 22 to 24 in hilly country. In order to secure a good straight line in the very open country it is sometimes advisable to set the line out first with a surveying instrument. A good tacheometer with vertical hairs in the lens is most suitable for this purpose. It is often quite necessary to give the men pegs to work by, otherwise they soon get adrift in erecting, and nothing looks worse than a straggly line in open country.

The whole line with extensions was completed in five months

and cost £3,000, or about £60 per mile complete with instruments. It was found of inestimable value during the construction of the main works, and the Chief Engineer estimated it had shortened the period of construction by several months, which is an item on a scheme costing £320,000.

After some four years' wandering in South Africa, I arrived back in London last Christmas, and many were the changes noticed in the National Telephone Company's work. This time I am back in another part of Africa, where I shall still look forward to the arrival of the JOURNAL each month.

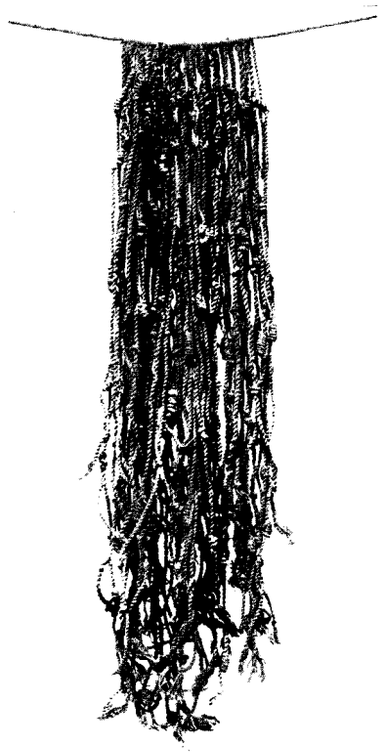
CORRESPONDENCE.

"COMMUNICATION."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

PERHAPS your readers might like to see the enclosed photograph of the Peruvian quipus mentioned in the article "Communication," on page 15 of the April number.

The quipus consists of a two-ply cord from which depends a fringe composed of 42 similar cords. Each of the elements of these two-ply cords is formed of a number of twisted fibre strands, some of which in the case of certain cords are coloured red and blue. Each cord has a number of knots disposed singly or in



groups at intervals, and these knots vary considerably in pattern; further, many cords have a supplementary cord attached to them, bearing knots also. Each cord is fastened to the foundation cord as follows:—A single cord composed of cotton strands is bent round the foundation cord, and the two ends twisted into a two-ply cord in which knots are subsequently tied. The specimen is part of the de Bolivar collection from the region of the Pacas Mayo Valley, Peru, and was acquired in 1907.

Leeds, May 7. W. V. MORTEN.

LATE WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

"In fine, that word is wisely fit,
Which strikes the fence, the marke doth hit."
(Translation: *Epitaph on Lucan.*)

April 4. EDGAR J. FRASER.

NUMBER, PLEASE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

To reduce the talking by operators to a minimum is certainly a laudable aim, but when no further reduction can be made without cutting out the ordinary courtesy of every day life, I think the minimum may be said to have been reached. Is Mr. Owen right in saying to drop the word "please" from the expression "Number, please," would exactly halve the work to be performed by the vocal organs? Surely, a third would be nearer the mark. Mr. Wicker's idea of a mechanical signal appears to me to have very serious drawbacks. Has he not overlooked the fact that an operator, when busy, often inserts a plug in the jack of one subscriber whilst actually taking the number from another? Observation forms will show that "Time operator plugs in" is very different from "Time operator answers." In this way the operator would possibly put down her lever in time to catch, say, the last two figures of a number. It would only be necessary for this to happen very seldom to annul any benefit gained by doing away with the expression "Number, please." Furthermore, it is none too certain, had she to endure so continual a buzz—possibly 150 times, or more, in a busy half-hour, added to the present click tests, etc.—that the strain on the operator would not be greater than had she to use her vocal organs as at present.

Rochdale, May 7. REGINALD W. BELL, Local Manager.

SUPERVISORS AND OPERATORS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE read with interest Miss Sweeney's paper in the May JOURNAL. As a teacher of telephone operating, one realises that the paragraph on the relation between supervisors (captains) and operators is, perhaps, the backbone of good exchange working, and would, if carried out, do wonders for the service.

In Birmingham a few years ago we experienced the troubles that must arise from party line transfer working, and the only way to bring these troubles to a minimum is good supervision by the party line operator, who must be a girl who can and will mentally follow the calls from the origination to the termination.

I would certainly advocate operators giving the number of any subscriber called for by name, should the number be known without connecting to the monitor. The standard expression used in such cases when giving a number is "Make a note, please." E. ADAMS, School Matron.

Birmingham.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE very practical suggestion—in relation to the operator supplying the number for an inquiring subscriber in place of further putting through—which Miss Sweeney gives us in her excellent paper "The Service from an Operator's Point of View," will be endorsed by all subscribers and not a few telephone women, more especially supervisors.

As a subscriber for many years I know the great annoyance, waste of time and trouble caused by having to wait for the essential number (which is not always to be found in the directory) from the supervisor or clerk-in-charge, but from an operator's point of view it is different, there may be a *dozen Smiths or as many Joneses to distinguish from.* This would necessitate conversation and prove an unfair drag on the operator, although a help to the subscriber and supervisor.

Many of the former are indolent enough, and will evade the directory if possible; also, operators in these days have much to remember, and they might not always prove so reliable for the *new* subscriber's number (*which is mostly the class for inquiry*) as the numerical register, but where a name such as Ben Evans be given, well remembered by the writer after four years' absence, there is much merit in Miss Sweeney's suggestion. CLERK-IN-CHARGE.

Scarborough, May 7.

"A LITTLE KNOWLEDGE IS A DANGEROUS THING."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

YOU might deem the following extract from a subscriber's letter worthy of a corner in the JOURNAL. The subscriber, in explanation of how his receiver got broken, writes: "I understand that the receiver cracked through a defect in same and not by reason of it being dropped. I am informed that the receiver cracked while it was being held in the hand *at the moment it would seem the exchange were endeavouring to ring the bell, the current for which passed through the receiver.*"

London, May 1. J. JOHNSON.

NEWS OF THE STAFF.

Mr. A. E. ABBOTT, late Exchange Inspector, London Wall, has been promoted to the post of Electrophone Manager, the Electrophone Department now coming under Mr. G. F. GREENHAM, the Metropolitan Electrician. The appointment dates from March 20.

Mr. F. C. WALLAGE, Chief Inspector, Margate, who has been transferred to Folkestone, was, prior to leaving, presented with a handsome pocket wallet by the staff as a token of respect and esteem. He left with every good wish for his future success.

Miss E. BLUCK, Senior Operator, Central Exchange, Birmingham, has been promoted to be Supervisor.

Miss EMILY WHALLEY, Monitor, Manchester Central Exchange, has resigned owing to ill-health. Prior to her leaving she was the recipient of a monetary testimonial from her colleagues as a token of kindly regard.

Miss ELIZABETH HIGGINS, late Clerk-in-Charge, Bridgeton Exchange, Glasgow, who recently resigned after close on twenty years' service, was the recipient of a dressing case, subscribed for by the operators, electrical staff and others. The presentation was made by Mr. Sinclair, who, in a few words, asked her to accept it with their good wishes. Miss Higgins was also presented with a silver purse bag, subscribed for by the chiefs and senior officers of the Traffic Department. In presenting this Mr. Rodger referred to her long and satisfactory service, and asked her to accept it with sincere wishes for her future welfare.

Miss J. DRENNAN, Senior Supervisor, Argyle Exchange, Glasgow, who was promoted to be Clerk-in-Charge, Bridgeton Exchange, was presented with a handbag and a comb by the staff of the Argyle Exchange.

Mr. S. SHEA has resigned his position as Instrument Inspector in Limerick to take up another position in Canada. The staff in the Limerick centre presented him with a travelling rug.

Mr. E. F. FOSTER has been promoted from the position of Cost Clerk to that of Contract Clerk, Dover.

Mr. E. W. WILSON, late Stores Clerk, has been promoted to Cost Clerk, Dover.

Mr. F. J. SANDIFORD, Second Inspector, Ramgate, has been promoted to be Chief Inspector, Margate.

Mr. A. H. MANSFIELD, Local Office Clerk, who has been transferred to Truro in the same capacity, was presented by Mr. Siberry, Local Manager, on behalf of the Newport staff, with a silver cigarette case.

Mr. R. H. RICHARDS, Clerk, district office, Cardiff, has been transferred to Newport as Local Office Clerk.

Miss ROSE HOWELL, Senior Supervisor, Manchester Central Exchange, has been promoted to be Monitor.

Miss AMY GUEST, Senior Operator, Manchester Central Exchange, has been promoted to be Supervisor.

The many friends of Mr. WILLIAM BENNET, Outstandings Clerk, Glasgow, will be sorry to hear that he has again been laid up by sickness and had to undergo an operation. The latest report is to the effect that he is progressing wonderfully well and is expected to be able to leave the hospital soon. Pending his return his position has had to be filled and this has been accomplished by transferring Mr. A. M. WATT from the Cashiership. Mr. Watt has been replaced by Mr. JOHN HOOD, formerly Record Clerk, and Mr. WILLIAM ANDERSON, as Fees Clerk, takes charge of the combined department dealing with Post Office fees and measured, etc., records.

Mr. A. BOYLE, Instrument Inspector, Belfast, has been transferred to Limerick vice S. Shea who has left for Canada.

Mr. WILLIAM BLOGG, Chief Contract Officer, Western district, has resigned and was presented by the staff with a tantalus.

Mr. R. T. EVERETT, Contract Officer, City, has been appointed Chief Contract Officer, Western district, in place of Mr. Blogg. He was presented on leaving with a silver cigarette case by the City staff.

Mr. T. BENSON, Fitter, Edinburgh, who was recently transferred to Bideford, was presented by his Edinburgh friends with a portmanteau, a smoker's outfit and a small dressing case.

The friends of Miss M. STEVENS, who resigned from Westminster Exchange in January, 1907, to take up the position of Clerk-in-Charge, at Colombo, will be sorry to hear she has been seriously ill since February last with enteric, and is now staying at Kandy to recoup. She does not expect to be able to resume her duties until the middle of June.

Mr. F. W. W. STAMMERS, Contract Officer, has been transferred from Peterborough to Great Yarmouth.

Miss L. BIRCH and Miss H. JOHNSON have been transferred from Junior to Senior Operators at Norwich.

Miss AMY TROTT, Operator at Brighton Exchange, has resigned owing to ill health.

On Saturday, May 9, the members of the "A" Course (Correspondence Classes) presented Mr. F. BENNETT with a silver-mounted tantalus as a slight recognition of the trouble taken with the members of the above course. Mr. Bennett, who is Chief Inspector at Portsmouth, has always taken a lively interest in the correspondence classes and is always ready to assist and explain anything in connection with them.

Mr. F. W ROBERTS, Local Manager, Brighton, was the recipient on May 18 of a handsome brass fire screen, subscribed for as a testimonial in slight recognition of his services as conductor of the telephony class at the Municipal Technical College. This class, of course, includes persons in the employ of the Post Office and other persons outside the Company's jurisdiction. The presentation was made by Mr. F. W. Taylor, District Manager, in a happy little speech, in which Mr. Roberts' services were eulogised. The recipient, in the course of a suitable reply, mentioned that it gave him great pleasure to conduct these classes, and mentioned furthermore that the attendance at this class was the best of any at the college.

Lineman Inspector W. REID was recently transferred from Chester to Crewe. He was presented with a silver cigarette case by the Chester staff.

Miss DAKERS, Clerk-in-Charge, Bolton, terminated thirteen years' service with the Company on May 14 to take up an appointment with the Egyptian Telephone Company as Exchange Superintendent at Alexandria. The switch-room staff presented Miss Dakers with a gold bangle and their best wishes for her future success.

Mr. C. FALLOWS and Mr. L. BLEACKLEY, of the Bolton district office staff, have both been incapacitated by illness since Feb. 6 and March 24 respectively. Mr. Fallows is happily recovering from a severe case of pneumonia, but Mr. Bleackley is still in hospital after an operation for appendicitis. Could hearty good wishes effect cures, both would long ago have been in robust health.

Mr. J. H. BELL, Switchboard Fitter, Dundee, has been presented by the staff with a travelling bag and brushes on the occasion of his transfer to the Testing Department, Nottingham Factory.

It is with sincere regret that we learn that Mr. W. E. POTTER, District Manager, Guildford, has undergone a serious operation at a nursing home. During his absence, Mr. C. G. RANSLEY, Engineer, Croydon, has been appointed to carry on the duties of Acting District Manager.

MARRIAGES.

An interesting ceremony was performed on May 8, when Mr. E. WILLIAMSON, District Manager, Birmingham, was presented by Mr. Cornfoot, on behalf of the staff, with a silver tea service and a waiter as a token of congratulation and of the good wishes of his staff on the occasion of his recent marriage. The greatest interest was taken in the proceedings by a full gathering and the remarks of the chairman were felicitous and appropriate. Mr. Williamson warmly thanked the givers for their kindness on behalf of himself and his wife.

Mr. H. BEACHER, Rental Clerk, Hull, was married on April 16. He was presented by the members of the staff with a clock and table.

Mr. GEORGE PLATTEN, Stores Clerk, East Coast district, was presented with a marble clock and luncheon cruet by the Norwich staff on April 27, on the occasion of his marriage.

Mr. A. W. BEAMES, Swansea District Office, was the recipient of a handsome marble clock on the occasion of his marriage recently. The presentation was made on behalf of the staff by the District Manager.

Miss M. COOK, Operator, Swansea Central Exchange, who recently resigned to be married, was presented by the Swansea operating staff with a silver cruet as a mark of esteem.

Mr. JAMES TAYLER, the Exchange Manager, Battersea, was married on April 25 to Mrs. Ruth McGregor. On the previous evening about 40 of his colleagues and friends assembled at the exchange and the Traffic Manager (Mr. J. F. Edmonds), on behalf of the staff, and in an appropriate speech, presented Mr. Tayler with a marble clock and a set of forks and spoons. Mr. Tayler would like to thank all those who so kindly contributed as he finds it impossible to do so individually.

On Miss E. KINIPPLE'S leaving the Holborn Exchange owing to her approaching marriage the operating staff presented her with a case of fish knives and forks.

Miss L. PENYSON, who has left the Hop Exchange, and who we understand is shortly to be married and will live in Hamburg, was presented by the staff on April 30 with a salad bowl and servers and a toast rack.

Miss T. TOWNSHEND, late Senior Supervisor-in-Charge of Kingston, was presented by her colleagues in the Battersea district with a standard lamp on resigning her position to get married.

Mr. A. W. ANGUS, Service Department, London, was presented by the staff with a handsome timepiece on the occasion of his marriage. The presentation was made by Mr. Gilmour of the same department.

Mr. A. CHEETHAM, Local Office Clerk, South Manchester, was presented with a drawing-room clock by the district and local office staff on the occasion of his recent marriage.

Miss JESSIE MILLAR, Operator, was presented by the Ayrshire staff with a handsome silver epergne on the occasion of her leaving the Company's service to get married. The presentation was made by Mr. G. A. Macdonald, District Manager.

Mr. W. T. EVANS (Metropolitan Construction staff) was presented on the occasion of his marriage with Miss A. BREWSTER, Operator in Charge (Claridge's Hotel), with a set of table plate and cutlery, by his colleagues and many friends at Kensington Exchange.

OBITUARY.

Mr. WILLIAM HURSHMAN, Fire Precaution Inspector, Manchester Central Exchange, died on May 13, aged 57. Prior to the Manchester Telephonic Exchange being formed in 1879 he was engaged with the firm of Messrs. Tracey & Lorraine, electrical engineers and contractors, and while in their employ took an active part in erecting telephone lines and fixing experimental apparatus. Upon the formation of the original Lancashire Telephone Exchange Company in 1879 he was engaged on the electrical staff and assisted at the installation of the first exchange telephone fitted in Manchester, at the offices of Messrs. T. G. Hill & Company, telephone No. 1. Mr. Hurshman's death occurred after a painful and lingering illness, and at the funeral, which took place on May 16 at the Cheetham Hill Cemetery, a beautiful wreath was sent as a token of sympathy from his old colleagues in the Manchester district.

STAFF GATHERINGS AND SPORTS.

London.—A most enjoyable evening was spent in the company of the City district engineers, who held a smoking concert on Friday, April 24, at the "Apple Tree & Mitre," Cursitor Street, E.C. Mr. A. Bascombe presided, assisted by Mr. F. W. Holder in the vice chair. The musical arrangements were ably conducted by Messrs. W. R. Penson and Walter Dance, an excellent programme of first-rate artistes being provided. A letter from the Metropolitan Superintendent regretting his absence was read by the chairman. Messrs. L. Harvey Lowe, C. Elliott and J. Stirling were among the invited guests present.

The second progressive whist party organised by the Traffic staff of the Bank Exchange was held on May 5 last. The result both socially and financially was most successful. The whist drive was held in aid of the Life Boat Saturday Fund and the sum of £3 has been handed over to the institution's secretary. The prizes were presented by the Traffic Manager, who congratulated the organisers of the Bank whist drives in a kindly and appreciative manner. The committee would like to thank those ladies and gentlemen who so kindly assisted them in the disposal of the tickets.

Leeds.—A concert promoted by the staff was held in the Tenant Hall, Blackman Lane, Leeds, on April 9, for the benefit of Mr. Arthur Atkinson, wayleave clerk, who is at present very ill. An excellent programme was presented, all the artistes giving their services. The amount realised, after payment of expenses, was nearly £13.

Northern Province.—*Cricket.*—Chambers Challenge Cup. Draw, 1908. First round: (A) Newcastle *v.* Middlesbro', at Newcastle; (B) Leeds *v.* Hull, at Leeds (winners 1907); (C) Huddersfield, a bye. Second round: Winner of (A) a bye; (E) Huddersfield *v.* winner of (B), at Huddersfield. Final: (F) Winner of (E) *v.* (D) on neutral ground.

Norwich.—*Rambling Club.*—On Saturday afternoon, May 9, the following places were visited during a ramble:—Earlham Hall, Park and Gardens (by permission of Reginald Gurney, Esq.); "Earlham Lodge" Grounds (by permission of A. F. Morse, Esq.); Earlham Church; Bowthorpe Hall Grounds (by permission of Robins Cook, Esq.); and Bowthorpe Church Ruins. An exceedingly pleasant time was spent.

Plymouth.—The second annual dinner and smoking concert took place on May 1 at the Plymouth Liberal Club, at which 50 members of the staff and their friends were present. Mr. Hooper, District Manager, was in the chair. After dinner an excellent musical programme was commenced which lasted until 12 p.m. A large number of the staff present contributed to the programme, which was arranged by Mr. A. Bennett. He had also secured some well-known and popular local singers who were greatly appreciated. A vote of thanks was

accorded the artistes and also the committee who arranged the dinner and concert, namely, Messrs. Bennett, Walton and Evans.

Liverpool.—A football match was played on Good Friday between the Liverpool Central and Liverpool Eastern Line and Labour staffs, resulting in a win for the former team by 6 goals to 2. A further match was played on Saturday, April 25, between the Liverpool Line and Labour staff and the Bootle Line and Labour staff, the former winning by 6 goals to 3.

Dublin.—A most enjoyable outing under the auspices of the Dublin District Cycling Club took place on Saturday, May 2, the place selected being Howth. Tea was served at the St. Lawrence Hotel and about 80 members of the staff and friends participated. A very good programme of songs, etc., was afterwards gone through and dancing was indulged in up till 11 p.m. when the party broke up. Mr. Manning, of the Engineer-in-Chief's staff, made the necessary arrangements, and is to be congratulated on the success of his efforts.

LOCAL TELEPHONE SOCIETIES.

Luton.—On April 24 Mr. S. J. Cain, Chief Inspector at Luton, gave his paper entitled "Installations." The subject was treated in a very able and instructive manner and was illustrated by numerous diagrams. Mr. Cain also gave several practical demonstrations of wiring, etc., his point in this branch of his subject being neatness. There was a good attendance, Mr. Wilson, District Manager, being in the chair.

Windsor.—At Windsor the staff recently formed a technical book club, the intention being to subscribe jointly for the purchase of some standard technical works and for the regular supply of the best British and American technical journals. The Engineer-in-Chief has very kindly supplied a list of the most suitable books and journals to obtain.

Reading.—The class formed to assist members of the Correspondence Classes has finished its work for the session, and the members presented the District Manager with a copy of the last edition of Munro & Jamieson's "Rules and Tables."

Dover.—The fifth meeting of the Dover telephone society was held in the district office on March 30, when the following papers were contributed: (1) "The Local Office and its Relation to the District Office," by Mr. F. Duerth (Local Manager, Dover). (2) "Canvassing," by Mr. J. Clinch (Contract Officer). Forty-nine per cent. of the members were present and two visitors.

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London.—The fourth annual meeting of this society was held at Salisbury House on April 29, 1908. There was an attendance of 150, including twenty guests, Mr. T. Fletcher being in the chair. After confirming an alteration to rule 6, the election of officers was proceeded with, with the following result:—President: Mr. H. Davis (Salisbury House); vice-presidents: Mr. L. Harvey Lowe (Salisbury House), Mr. J. F. Edmonds (Salisbury House), Mr. J. Stirling (Salisbury House); committee: Mr. W. M. France (Head Office), Mr. D. Stuart (Head Office), Mr. J. Gall (Head Office), Mr. P. Mantle (City), Miss F. J. Minter (City), Miss E. Ralph (North), Mr. J. T. Leete (South-East), Mr. C. Elliott (Salisbury House), Mr. G. Greenham (Salisbury House), Mr. W. F. Taylor (Salisbury House), Mr. G. Pratt (West), Mr. F. Macmillan (West), Miss A. Reekie (East), Mr. R. Ridge (Croydon), Mr. F. Blick (South-West); hon. secretary and treasurer: Mr. W. K. Cherry. Mr. J. Stirling now proposed and Mr. F. Gill seconded a vote of thanks to the retiring officers, and this was given. The presentation of prizes to the winners of the junior competition was the next item, the winners being as follows:—"Electrical Work,"—First prize, value 21s., to Mr. C. H. Phillips (London Wall). Special prize, value 21s., to Mr. H. G. Bishop (Head Office). "Office Work."—First prize, value 21s., to Mr. G. H. Cole (South). Consolation prize, value 21s., to Mr. L. J. Farries (Head Office): value 10s. 6d., to Mr. N. J. French (Salisbury House). "Operating."—First prize, value 21s., to Miss M. Coulman (Kensington). Consolation prize, value 10s. 6d., to Miss W. Etheridge (Traffic). "External Engineering."—First prize, value 21s., to Mr Harvey A. Smith (Metropolitan Engineers). The four prize papers were read, but not discussed, and this brought the 1907-8 session to a close.

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Bolton.—The fifth meeting of the society was held on March 10, Mr. A. C. Haley occupying the chair. Mr. J. Wilson, Cost Clerk, Bolton, gave a very instructive lecture on "Measured Rate Fees," illustrating his remarks by a few well-drawn diagrams, and an interesting and lively discussion followed.

The second paper was given by Mr. W. Bocock, entitled "The Power Plant." The design and equipment of power plant equipment was clearly explained by the aid of several diagrams and some samples showing the stages in the construction of a chloride accumulator.

The general meeting of the society was held on May 7, Mr. A. C. Haley presiding. A report of the work of the session was read and discussed. The president, Mr. A. C. Haley, and hon secretary and treasurer, Mr. W. Higson, together with the vice-presidents and committee, were thanked for their services, and re-elected to the same offices. The evening terminated pleasantly in musical and social fashion.

Newcastle.—The seventh and last meeting of the telephone society was held on April 28, with Mr. R. W. Jackson in the chair. The election of officers for the next session was proceeded with and the following were duly elected:—President, Mr. F. W. Gaskins; vice-presidents, Messrs. R. W. Jackson, E. T. Payne, E. Spink, W. G. Douglass; secretary, Mr. A. McEwan; committee, Messrs. W. H. Abbot, J. Gwyther, J. P. Urwin, G. Marshall, F. McArdle, H. Dent, C. W. Hall, O. Preston, G. Tait. The secretary read out the financial statement for the past session, which showed a good balance in hand. A paper was given by Mr. F. W. Gaskins on "Some Details of Development Studies." This was intended to follow up a paper given by Mr. A. Watts earlier in the session. Mr. Gaskins went thoroughly into the question of transmission, and gave a clear explanation of this difficult subject. The paper was very interesting and instructive.

Western (London).—The last ordinary meeting of this society for the 1907-8 session was held on March 26 last, when Mr. G. E. Boniface read a paper on "Overhead Construction." The lecturer dealt with the various faults met with in overhead work and their chief causes. The use of the copper jointing sleeves was also explained, and illustrations of them and the method of fixing was shown by means of lantern slides. At the conclusion of the reading several members raised discussion on what had proved to be a most interesting paper.

A general meeting of the society took place on May 7, when business dealing with the past and forthcoming sessions was transacted. The following members were elected as officers and committee for the 1908-9 session:—President, Mr. A. Wright; vice-presidents, Messrs. F. M. Hall and J. H. Stewart; secretary, Mr. E. Layton; committee, Messrs. T. A. Beck, G. E. Boniface, R. H. Drury, E. How, J. Johnson, R. F. Martin, E. H. Milne, E. Randell, F. O. Steed, W. C. Lane and G. E. Beaven.

THE NATIONAL TELEPHONE STAFF HOSPITAL COLLECTIONS.

AT the quarterly committee meeting of the above, held at Salisbury House on May 8, the hon. treasurer reported that the collections for the quarter ended March 31 amounted to £173 5s. 4d., being a record amount for the Company's staff, and one which, if maintained, would show an increase of £250 per annum over the last year's subscription.

The hon. secretary also reported that the letters issued to the staff for the corresponding quarter numbered 136, being divided as follows:—

Letters for	dental work (private dentists)	60
,, ,,	,, ,, (dental hospitals)	7
,, ,,	women's hospitals	1
,, ,,	childrens' ,,	10
,, ,,	general ,,	11
,, ,,	skin ,,	4
,, ,,	chest ,,	8
,, ,,	eye ,,	8
,, ,,	ear, nose and throat	10
,, ,,	dispensaries	2
,, ,,	convalescent homes	4
,, ,,	surgical appliances	8
,, ,,	ambulance to hospitals	2
,, ,,	specialists' advice (half fees)	1

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London.—The fourth annual meeting of this society was held at Salisbury House on April 29, 1908. There was an attendance of 150, including twenty guests, Mr. T. Fletcher being in the chair. After confirming an alteration to rule 6, the election of officers was proceeded with, with the following result:—President: Mr. H. Davis (Salisbury House); vice-presidents: Mr. L. Harvey Lowe (Salisbury House), Mr. J. F. Edmonds (Salisbury House), Mr. J. Stirling (Salisbury House); committee: Mr. W. M. France (Head Office), Mr. D. Stuart (Head Office), Mr. J. Gall (Head Office), Mr. P. Mantle (City), Miss F. J. Minter (City), Miss E. Ralph (North), Mr. J. T. Leete (South-East), Mr. C. Elliott (Salisbury House), Mr. G. Greenham (Salisbury House), Mr. W. F. Taylor (Salisbury House), Mr. G. Pratt (West), Mr. F. Macmillan (West), Miss A. Reckie (East), Mr. R. Ridge (Croydon), Mr. F. Blick (South-West); hon. secretary and treasurer: Mr. W. K. Cherry. Mr. J. Stirling now proposed and Mr. F. Gill seconded a vote of thanks to the retiring officers, and this was given. The presentation of prizes to the winners of the junior competition was the next item, the winners being as follows:—"Electrical Work,"—First prize, value 21s., to Mr. C. H. Phillips (London Wall). Special prize, value 21s., to Mr. H. G. Bishop (Head Office). "Office Work."—First prize, value 21s., to Mr. G. H. Cole (South). Consolation prize, value 21s., to Mr. L. J. Farries (Head Office); value 10s. 6d., to Mr. N. J. French (Salisbury House). "Operating."—First prize, value 21s., to Miss M. Coulman (Kensington). Consolation prize, value 10s. 6d., to Miss W. Etheridge (Traffic). "External Engineering."—First prize, value 21s., to Mr. Harvey A. Smith (Metropolitan Engineers). The four prize papers were read, but not discussed, and this brought the 1907-8 session to a close.

Brighton.—On May 7, with Mr. F. Roberts in the chair, in the unavoidable absence of the District Manager, Mr. C. F. Moorhouse, Contract Manager, delivered a paper on "Contract Work," illustrated by several curves, etc. His paper dealt with "Measured Rate Tariffs," "Private Branch Exchange Business," "Development Study," and "Some Possibilities of the Telephone Service." The speaker outlined the history of the introduction of the measured rate in America and its adoption in this country, and lucidly set out the advantages of the new rates as compared with the old. Attention was drawn to the growth of the private branch exchange business in America and the advancement it has made in this country during the past few years. He then dealt with "Development Study," setting out the classification of the various properties, and the estimated number of probable subscribers, and why a development study was necessary. Mr. Moorhouse then passed on to the great possibilities of the "Shopping by Telephone" system, and drew attention to the increased rate of calling on wet days, pointing out that the public were to-day ready to shop by telephone if the shopkeepers would only make adequate provision for receiving telephone calls. On the conclusion of the lecture a very keen discussion followed, which lasted an hour and a half, the majority of the members of the contract staff taking part. Mr. Moorhouse effectively replied to all points raised.

Bolton.—The fifth meeting of the society was held on March 19, Mr. A. C. Haley occupying the chair. Mr. J. Wilson, Cost Clerk, Bolton, gave a very instructive lecture on "Measured Rate Fees," illustrating his remarks by a few well-drawn diagrams, and an interesting and lively discussion followed.

The second paper was given by Mr. W. Bocock, entitled "The Power Plant." The design and equipment of power plant equipment was clearly explained by the aid of several diagrams and some samples showing the stages in the construction of a chloride accumulator.

The general meeting of the society was held on May 7, Mr. A. C. Haley presiding. A report of the work of the session was read and discussed. The president, Mr. A. C. Haley, and hon. secretary and treasurer, Mr. W. Higson, together with the vice-presidents and committee, were thanked for their services, and re-elected to the same offices. The evening terminated pleasantly in musical and social fashion.

Newcastle.—The seventh and last meeting of the telephone society was held on April 28, with Mr. R. W. Jackson in the chair. The election of officers for the next session was proceeded with and the following were duly elected:—President, Mr. F. W. Gaskins; vice-presidents, Messrs. R. W. Jackson, E. T. Payne, E. Spink, W. G. Douglass; secretary, Mr. A. McEwan; committee, Messrs. W. H. Abbot, J. Gwyther, J. P. Urwin, G. Marshall, F. McArdle, H. Dent, C. W. Hall, O. Preston, G. Tait. The secretary read out the financial statement for the past session, which showed a good balance in hand. A paper was given by Mr. F. W. Gaskins on "Some Details of Development Studies." This was intended to follow up a paper given by Mr. A. Watts earlier in the session. Mr. Gaskins went thoroughly into the question of transmission, and gave a clear explanation of this difficult subject. The paper was very interesting and instructive.

Western (London).—The last ordinary meeting of this society for the 1907-8 session was held on March 26 last, when Mr. G. E. Boniface read a paper on "Overhead Construction." The lecturer dealt with the various faults met with in overhead work and their chief causes. The use of the copper jointing sleeves was also explained, and illustrations of them and the method of fixing was shown by means of lantern slides. At the conclusion of the reading several members raised discussion on what had proved to be a most interesting paper.

A general meeting of the society took place on May 7, when business dealing with the past and forthcoming sessions was transacted. The following members were elected as officers and committee for the 1908-9 session:—President, Mr. A. Wright; vice-presidents, Messrs. F. M. Hall and J. H. Stewart; secretary, Mr. E. Layton; committee, Messrs. T. A. Beck, G. E. Boniface, R. H. Drury, E. How, J. Johnson, R. F. Martin, E. H. Milne, E. Randell, F. O. Steed, W. C. Lane and G. E. Beaven.

THE NATIONAL TELEPHONE STAFF HOSPITAL COLLECTIONS.

At the quarterly committee meeting of the above, held at Salisbury House on May 8, the hon. treasurer reported that the collections for the quarter ended March 31 amounted to £173 5s. 4d., being a record amount for the Company's staff, and one which, if maintained, would show an increase of £250 per annum over the last year's subscription.

The hon. secretary also reported that the letters issued to the staff for the corresponding quarter numbered 136, being divided as follows:—

Letters for dental work (private dentists)	60
,, ,, ,, ,, (dental hospitals)	7
,, ,, women's hospitals	1
,, ,, childrens' ,, ...	10
,, ,, general ,, ...	11
,, ,, skin ,, ...	4
,, ,, chest ,, ...	8
,, ,, eye ,, ...	8
,, ,, ear, nose and throat	10
,, ,, dispensaries	2
,, ,, convalescent homes	4
,, ,, surgical appliances	8
,, ,, ambulance to hospitals	2
,, ,, specialists' advice (half fees)	1

WHAT THE COMPANY IS DOING.

DURING the past month exchanges have been opened at Hawarden, Great Hanwood and Deganwy in the Chester and North Wales district, at Royston in the Sheffield district, at Lilliput in the Hants and Dorset district, and at Avonmouth in the Bristol district, making a total now open of 1,482. There was a net increase of 2,808 stations during April, making a grand total of 457,622.

Underground Work.—Work on the underground scheme at GOUROCK has been commenced, as also the conversion of an overhead earth circuit system at BARRHEAD to an underground metallic circuit system. Half a mile of pipe has been laid for relief cables between WINDSOR and DATCHET. The mileage of underground work in the EDINBURGH district should have been stated last month as upwards of 32,000 miles. It was increased "by" and not "to" 854 miles.

Extensions.—An additional switchboard, multipling subscribers, has been fitted at BEVERLEY, East Yorkshire; an additional 50-line board with multiple has been added at the MAINDEE Exchange, an additional 50-line board at the TREDEGAR Exchange, and the 20-line board at BLACKWOOD has been replaced by a 50-line board.

At HAWICK the system is being converted from earth to metallic circuit, partly underground, and a 200-line multiple switchboard and 500-line testboard is being fitted in the larger premises which have been taken.

Private Branch Exchanges.—In LONDON, Messrs. Derry & Toms, Kensington, have signed a contract for ten junctions and 21 stations; Messrs. Harrod's have had 80 extension instruments fitted throughout their premises for the use of their customers, and taken ten additional junctions, and the Army & Navy Stores have taken 84 additional stations. The London County Council's installation has been equipped for common battery working, and they now have 321 stations in all. The Piccadilly Hotel is liberally equipped with 336 telephones. At OLDHAM, Messrs. Braddock have an installation with two junctions and eleven stations. The Norfolk County Council and the Norwich Union Fire Insurance Society have each had five junctions and twenty extensions installed. The Edinburgh Life Assurance Company have signed an agreement for two junctions and fifteen extensions.

EDINBURGH.—*Scottish National Exhibition.*—The executive have decided to rent from the Company a fire alarm system. A sixteen-line switchboard will be installed, connected with the Central Fire Station and with twenty points in the exhibition.

The Brighton Contract Department have completed negotiations with the Eastbourne Corporation for the connection of the three principal cab shelters in the town.

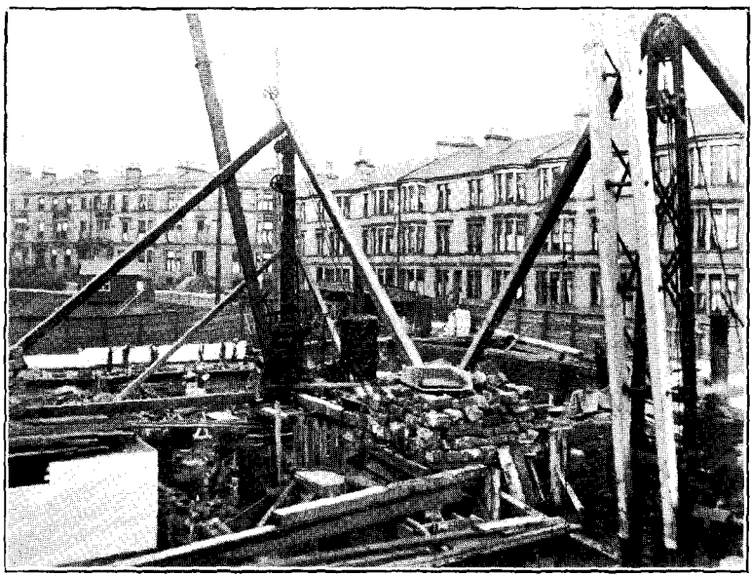
NEW EXCHANGE AT HILLHEAD, GLASGOW.

A START has now been made with the laying of the foundation of the new exchange building in Hillhead. It has been recognised for some time that the present premises are much too small to enable proper provision to be made for the rapidly increasing telephone requirements of the important residential district of Hillhead and the no less important burgh of Partick, but it is clear that in the proposed new exchange these requirements will be fully met.

The site was chosen after the usual careful investigations had been made as to the proper centre for the exchange, and this happens to be quite close to the present exchange. The building, which will be of fire-proof construction throughout, is to consist of a basement and three other flats, the former to be occupied as district stores. The whole of the ground floor and parts of the second and third flats are to be let as dwelling-houses of three, four and five rooms and kitchen, while the apparatus rooms and the switchroom will be on the second and third flats respectively. The apparatus will be arranged for common battery working and accommodation will be provided for 10,000 lines.

As the building is being built primarily as an exchange, it is possible to arrange matters so that the operators and inspectors employed will carry on their work under the best possible conditions. The exposure will be southerly and westerly, so that they will get all the sun that is going, and the light will be admitted by a long lantern arrangement. The plan also makes provision for dining and retiring rooms for the operators, and space has been reserved for the bicycles of those members of the staff who ride to business.

The position of Hillhead Exchange is admirably suited for the residential districts of Hillhead, Dowanhill, Partickhill, Hyndland and Kelvinside, while it is within a radius of about a quarter of a



mile from such important places as the University, the Western Infirmary, the Observatory, the Botanic Gardens and Partick Cross. The site is thus an ideal one, occupying as it does the west corner of Caledon Street, where it joins Highburgh Road, a fine thoroughfare of over 80 feet wide, running at right angles to, and westward from, Byres Road—a busy thoroughfare extending from Partick Cross on the south to the Botanic Gardens on the north, while the access to it from all sides is all that could be desired.

STAFF BENEVOLENT SOCIETY—BRIGHTON.

AFTER a very long delay the rules of this society have just been sanctioned and the society registered as a friendly society according to law. The first balance sheet has just been brought out giving the figures of the working from April to Dec. 31, 1907, from which document it is seen that the total receipts for that period were £34 17s. 1½d. During the same period subscriptions were made to the local hospitals, dispensaries, etc., to the amount of £13 2s. 6d., and grants to the number of four were made to necessitous members, totalling £7 10s. At the close of the period the secretary had a balance in hand of £13 17s. 1½d. Taking everything into consideration this is not at all an unsatisfactory state of affairs for a small society, which at Jan. 1, 1907, numbered 213 members.

EDINBURGH CLASSES.

THE results obtained by the members of the Edinburgh staff who attended classes during the past winter have now been ascertained. The under-mentioned are noteworthy:

At Heriot Watt College.—Medallist in Advanced Electrical Engineering: David Christian, learner. First-class Certificates in Telephony, Telegraphy and Laboratory Work: Duncan McIntosh, engineer. Certificates of Merit in Telephony: R. C. Wilson, A. F. Dunn, district office; G. M. Bennett, J. Crear, John Graham, electrical staff; F. Horton, learner. Certificate of Merit in Intermediate Mathematics: John Pirie, district office. Certificate of Merit in First Year Electrical Engineering: S. R. McKenna, foreman jointer. Certificate of Merit in English: John Conacher, district officer.

At Continuation Classes.—Prizeman in English: W. Bradley, district office. Certificate in Magnetism and Electricity and Physics: J. Hare, learner.

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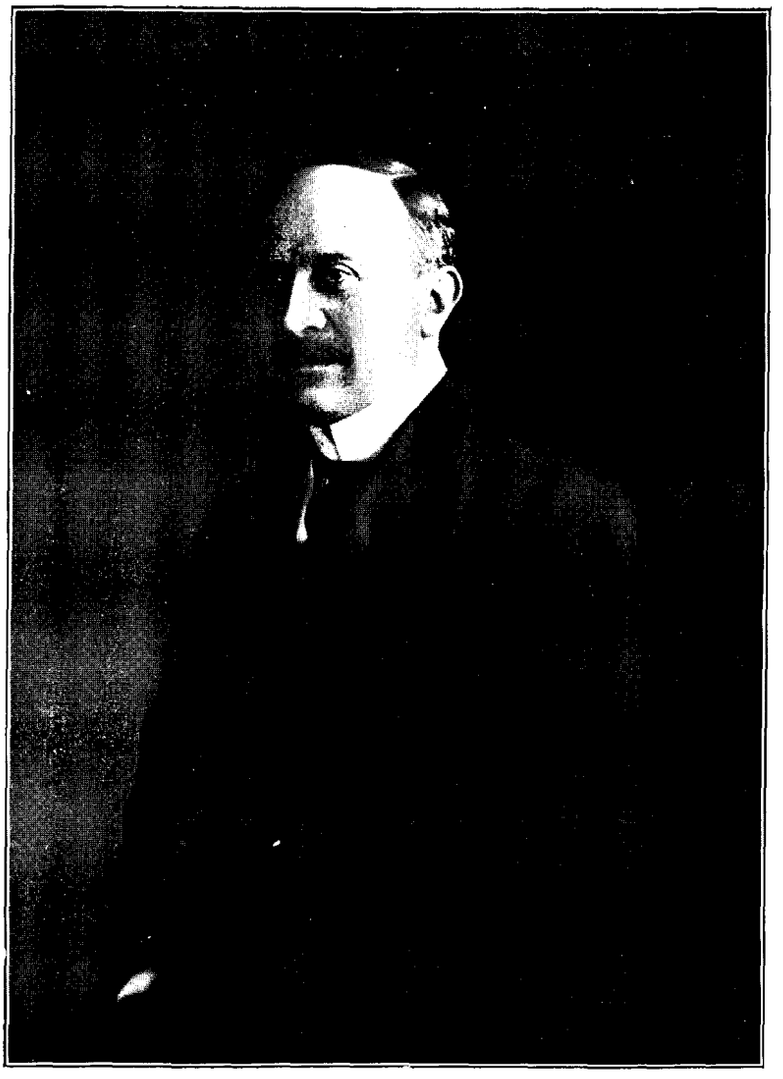
TELEPHONE MEN.

XXVI.—ARTHUR EDGAR COTTERELL.

ARTHUR EDGAR COTTERELL was born in Moseley, a suburb of Birmingham, on May 15, 1864, and has lived practically his whole life in the famous Midland city. The principal part of his education was received under a private tutor, Professor J. H. R. BAYLEY, and at the Birmingham and Edgbaston Proprietary School. He also studied electricity and magnetism at the Mason Science College.



[*Photograph by* H. J. WHITLOCK & SONS, LIMITED, *Birmingham.*

Mr. COTTERELL entered the telephone service fresh from his studies on Nov. 11, 1879, his first employers being a syndicate in Birmingham known as the "Midland Telephone Exchange," afterwards formed into "The Midland Telephone Company, Limited." At the time Mr. COTTERELL joined there was no telephone exchange but merely a private line with an instrument at each end for exhibition purposes, and, as he puts it, "just a few chairs and tables and a pile of glowing circulars, myself forming the whole clerical staff from chief clerk to office boy: and from the fact that we had a managing director, a secretary and a consulting electrician it will be seen that the staff did not lack supervision." A month or so later the telephone exchange was opened with less than a dozen lines, provided free on trial for three months.

In 1881 the Midland Telephone Company sold their undertaking to the Provincial Telephone Company, who in turn transferred it to the National Telephone Company, Limited, and Mr. COTTERELL'S services were retained. Shortly afterwards, in the same year, he was transferred from the clerical to the technical department, and thus given opportunities of acquiring an experience which was to stand him in good stead. Not only did he gain practical experience in the instrument department, and in the oversight of line work, but also in the operating, for he undertook for several months the day service at the Bennetts Hill Exchange during the illness of the regular operator. Later on Mr. COTTERELL was placed in charge of the instrument and operating departments, and afterwards made, under the title of Chief Inspector, practically an Assistant to the District Manager, being deputed by the latter to oversee and direct all the departments, and he was instructed by the then General Manager to qualify himself generally for a full managerial position.

After serving in this capacity for about a year, Mr. COTTERELL left the service in October, 1884, with the idea of bettering his position, going into partnership with his brother, Mr. C. W. COTTERELL, as surveyors and electrical engineers.

In March, 1886, Mr. COTTERELL was asked by the newly appointed Midland General Manager, Mr. COLEMAN, whether he would like to return to the Company's service in the definite position of Manager for the Potteries district, and he accepted the offer which brought him back into so congenial a field, and took up his duties in April. In less than three months, viz., June, 1886, he was transferred to Birmingham as Manager there.

At the reorganisation in 1893 when the country was divided into provinces and districts he was appointed District Manager for the Birmingham district, and on Jan. 1, 1900, he became Assistant Provincial Superintendent for the Midlands, a position which he now vacates, being called to London in order to take up a similar post in the Southern Province with its 321 exchanges.

In the early days he derived much interest and experience through being chosen for assisting in the experiments which were then very largely made. Although this brought him in touch with various movements of others, he did a good deal on his own initiative and devoted much of his leisure time to study and experiment. In the days before the general application of metallic circuits, he devoted considerable effort to the overcoming or minimising of induction.

Duplex telephony found in him a warm supporter, and it received very early practical application, when in 1892 he adapted it to certain private lines. In the case in question two doctors each rented private lines between their respective surgeries. Their premises at both ends were almost next door and the lines each about three miles long, the induction between the two single lines was the source of much complaint and vexation. Mr. COTTERELL turned the existing two wires into a loop for one doctor and gave the other a superimposed single circuit, thereby doing away with the trouble at a trifling expense and thoroughly satisfying both. The success of this led to a more general use of duplexing and superimposing in the junction service. In the early days the usual procedure was to balance the superimposed circuits by means of resistance coils. Mr. COTTERELL, however, experimented in a different manner, viz., by balancing translator coils, with considerable success. This was prior to the general adoption of the now recognised duplex translators.

In the matter of cable work he has had considerable experience dating back to the laying of the first underground telephone work laid in this country in 1880, and the first underground cable which was experimentally laid in 1882. On the adoption of the dry-core cable Mr. COTTERELL became very strongly imbued with the possibilities which this offered for centralising a number of exchanges, and in 1895 very strenuously urged a scheme which he prepared for closing a number of sub-exchanges and bringing their wires on to the switchboard at the Birmingham Central Exchange. This was ultimately approved and proved very successful, though the subsequent enormous growth of the service which has since led to an overflowing of the practical capacity of the central multiple board has necessitated a decentralisation, but the cables laid down on Mr. COTTERELL'S scheme have proved of great value for providing junction accommodation.

At one time Mr. COTTERELL lectured frequently on the telephone and wrote for the scientific press on telephone, telegraphic and other scientific matters. On his appointment as Birmingham Manager in 1886 he very strongly urged the formation of the Electrical Society which was ultimately formed in 1889, and which was perhaps the first society ever formed by the Telephone Company's staff.

Whilst Mr. COTTERELL is a very enthusiastic telephone man, he differs from perhaps the majority of his colleagues in one marked respect, and that is in the matter of recreation. He is no devotee of athletics. He does not deprecate them, but they simply do not appeal to him. He has lived for a number of years within a stone's throw of a county cricket ground and has never bothered to see a match. As to exercise he is in the habit of saying, "My athletic friends have to keep up their exercise or they get a liver on them. Should I develop one I shall have a (to me) novel antidote to fall back upon." For recreation he finds his friends and hobbies all sufficient. The latter are chiefly astronomy, photography and reading—particularly in the realms of physics. He is very fond of music, and at one time often took part in amateur theatricals.

GLASGOW DISTRICT—EVENING CLASSES.

THE results of the various evening classes in telephony and kindred subjects have now been declared and are very satisfactory. The following members of the staff have taken certificates as shown; some have good results for two or more classes:—

CLERICAL DEPARTMENT.—Technical College.—First class: Duncan Skirving, Andrew B. Stark, Wm. Patterson, Alex. McLean. Second class: Herbert Thomson (2), Wm. Young, George Martin, Andrew B. Stark, George W. Millar, Gilbert Taylor. Board School.—First class: J. F. Murray, James Paton, Miss Collie, Robt. Morton, Miss C. McGilp.

ELECTRICAL DEPARTMENT.—Technical College.—First class: Douglas C. Baillies, Arthur A. Colston, Thos. Haveron, Robt. A. Wright (2), Louis Brown, Wm. Cooper, George E. Hewson, George Henry, John Noddings, David Ross, Wm. A. Russell, Andrew Watt, Thos. Bell, George M. Brown, Andrew S. Sutter, Robt. Gavin. Second class: Thos. Grace, Thos. H. McArthur, John Bannerman, Wm. Carrick, H. H. Bastable, James D. Dinwoodie, George M. Hale, Andrew Watt (2), James N. McAllan, John Sinclair, Louis S. Summers, John G. Pettigrew, Ian McLean.

ENGINEERING DEPARTMENT.—Technical College.—First class: Robt. F. Gilchrist (2), Robt. S. Graham. Second class: Donald G. Graham, Murdoch MacLean.

TRAFFIC DEPARTMENT.—Technical College.—Second class: Wm. Frame (2).

THE NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION.*

THE STAFF'S CASE FOR RECOGNITION OF PAST SERVICES.

BY W. R. BOLD.

THE staff claims that, on the transfer of the National Telephone Company's undertaking to the POSTMASTER-GENERAL on Dec. 31, 1911, those members of the staff, not in receipt of a salary of £700 per annum or upwards shall, apart from a portion of the labour staff, become established servants of the Post Office, entited to pension, and be allowed to count their past service in connection with the telephone undertaking as service under the Crown.

It must be admitted that the staff has no legal claim to the benefit of its past services, but its moral and equitable claim could not possibly be stronger, as will be seen from the following facts:—

At the date of the agreement for the sale of the Company's undertaking to the POSTMASTER-GENERAL, the only cases where private undertakings had been acquired by the POSTMASTER-GENERAL were those of the sale to the POSTMASTER-GENERAL of certain telegraph undertakings carried on by various companies.

The first case was that of the purchase by the POSTMASTER-GENERAL, under the provisions of the Telegraph Act of 1868, of the undertakings of the Electric and International Telegraph Company, the British and Irish Magnetic Telegraph Company and the United Kingdom Electric Telegraph Company, Limited, and Section 8, sub-section (7) of that Act provided that the past services of such officers of the telegraph companies as entered into the service of the POSTMASTER-GENERAL should count as service with the Crown, and so become pensionable notwithstanding the fact that under the terms of their service with the telegraph companies they would not, if the purchase had not taken place, have been entitled to a pension from the company they were serving.

The next case, and the only other one there appears to be, was the purchase by the POSTMASTER-GENERAL of the plant of the Submarine Telegraph Company.

The Submarine Telegraph Company commenced business in 1850. In 1870, owing to the monopoly acquired by the POSTMASTER-GENERAL under the Telegraph Act, 1869, and the fact that the Submarine Telegraph Company was not in a position to land its cables on the shores of this country without a license from the Government, the Submarine Telegraph Company entered into an arrangement with the POSTMASTER-GENERAL and accepted a license expiring in 1889. On the expiration of this license the POSTMASTER-GENERAL purchased the telegraph cables owned by the company, and the whole of the company's staff (save eleven who were compensated) were taken into the service of the POSTMASTER-GENERAL, but were given no pensionable rights in respect of their past service with the company. In view of what had taken place on the transfer of the staffs of the other telegraph companies in 1870, the staff of the Submarine Telegraph Company was naturally dissatisfied and commenced an agitation to obtain from the POSTMASTER-GENERAL recognition of its past services, which agitation terminated in an appeal to the Tweedmouth Committee.

The Tweedmouth Committee reported in favour of the staff, with the result that the Telegraph Act of 1897 was passed. Section 3 of that Act provided that any officer or clerk formerly in the service of the Submarine Telegraph Company, Limited, who on the purchase of that company entered into the permanent Civil Service of the State, should for superannuation count his past years of service with the Company since Jan. 28, 1870, as years passed in the Civil Service. It will be seen from this that the staff of the Submarine Telegraph Company ultimately secured full recognition for pension purposes of its services with the company during the whole of the time the company carried on its business under license, notwithstanding the fact that the license was for a fixed term expiring without notice.

* Any questions or correspondence with regard to news relating to the Staff Transfer Association must be addressed to the principal secretary of the Association.

Although of course no personal action of the POSTMASTER-GENERAL is involved, the transfer of the Metropolitan water companies to the Water Board under the provisions of the Metropolis Water Act, 1902, is also very much to the point, inasmuch as that Act provided—Section 47, sub-section (8)—that in computing for pension purposes the time of service of any officer taken over from a Metropolitan water company "the period during which he has been in the service of a Metropolitan water company shall be included," and the Government in passing that Act once more confirmed the principle that a public body in taking over an undertaking must recognise the past services of the staff taken over with the undertaking. It may also be noted that this principle has been fully recognised and adopted in drafting the Port of London Bill which (backed by Mr. BUXTON among others) was brought in this Session by Mr. LLOYD-GEORGE and is now being considered by a Joint Committee of both Houses of Parliament.

In taking over any undertaking the purchaser must of necessity reap to a certain extent the benefit of the services of the staff which created or built up such undertaking.

What are the facts in connection with the transfer of the National Telephone Company's undertaking to the POSTMASTER-GENERAL. The Company has been carrying on the main portion of its business under license from the POSTMASTER-GENERAL and, at any rate since 1896 when the trunk lines were transferred to him, have been carrying on such business practically as agents for the POSTMASTER-GENERAL. The POSTMASTER-GENERAL has during the whole period of the Company's license received from the Company a royalty at the rate of 10 per cent. on the gross revenue received by the Company from its licensed business. The royalties paid up to the present amount now to over £2,500,000, and even supposing for the sake of argument that the Company's revenue was to increase only in the same ratio, he will receive by the date of transfer practically another £1,500,000 from the telephone undertaking (making a total of £4,000,000) without having risked a penny to earn the same. In addition to this the POSTMASTER-GENERAL will secure the Company's undertaking without, so far as the main portion of its licensed business is concerned, paying anything for goodwill.

Seeing that the Post Office and Parliament have already agreed, as is shown by the Acts I have quoted, that it is only just and equitable to recognise the past services of staffs taken over, notwithstanding the fact that the purchaser has received no portion of the revenue earned prior to transfer and has had to pay for goodwill, surely the POSTMASTER-GENERAL, having received such an enormous revenue and being about to acquire for nothing such a valuable asset in the form of goodwill, will not refuse to give to the staff of the National Telephone Company the benefit of its past services in the same manner as was done in the cases of the telegraph and water companies, in which the claims of the staffs concerned were not nearly so strong.

In the course of the evidence given before the Select Committee on the Post Office (Telephone Agreement), 1905, it was suggested on behalf of the Post Office that the cases dealt with by the Telegraph Act, 1868, and Metropolis Water Act, 1902, should not be treated as precedents seeing that they related to the compulsory purchase of going concerns whilst the purchase of the National Telephone Company's undertaking would be by Agreement between the parties and take place at the expiration of the Company's license.

In the first place it will be noted that the case of the purchase by the POSTMASTER-GENERAL of the Submarine Telegraph Company's cables is not included in the above objection and that, naturally, seeing that it is a case on all fours with the present, it will also be noted that the POSTMASTER-GENERAL evidently in the first instance took up the same position with regard to the staff of the Submarine Telegraph Company, who, however, as we have already seen, finally secured recognition of their past services. But what about the objection itself. The following statement made by the Secretary to the Post Office during the course of his evidence before the Select Committee appears to be the basis of it:—

"That right to carry on business was brought to an abrupt termination by the action of the Legislature, and it appears to me that as regards the prospects of the staff to any special terms as regards continuity or pension the fact that the right to carry on business was abruptly terminated by the Legislature constitutes an entire difference between that case and the present case."

Although there is not to my mind any such material difference in the cases as that implied by this statement I am willing to admit that there is a difference between compulsory purchase owing to the Legislature stepping in and purchase by agreement. But surely there can be no practical difference between the two cases so far as what has gone before the date the Legislature steps in or the voluntary agreement is arrived at, is concerned, inasmuch as the real difference between the two cases is this: In one case the Legislature says you shall not carry on business any more and in the other you say we agree not to carry on business any more.

The past services of the staff in the one case appear to be quite as valuable as in the other, and as fully entitled to recognition.

Further, it is not correct to look upon the Company's business as a business which must have stopped with the expiration of the Company's original license on Dec. 31, 1911, seeing that prior to the date of the Post Office telephone agreement of 1905 the policy of Parliament, as embodied in the Telegraph Act, 1899, was to grant new licenses to local authorities and, subject to certain conditions, to extend the Company's license in the area affected by the new license for the period specified in the new license. Under the provisions of the Act of 1899 the Company's license had been extended in certain areas, in two cases, to 1926, and if the policy of the Government with respect to telephones had not changed this process of extending the Company's license, would, no doubt, have continued.

In addition to this the Company were at liberty to carry on its private wire business, which is a very large one, for ever.

I think I may sum up the position shortly as follows:—

The POSTMASTER-GENERAL has taken, throughout the whole of the Company's existence, by way of royalty, a portion of the result of the staff's work, and will, after the transfer, take a further portion in the shape of goodwill; and the staff asks him to place it in the same position as other staffs (from whose work prior to transfer he derived no benefit) have been placed. Surely this is not only reasonable but necessary in order to prevent that feeling of injustice arising among the staff which is so prejudicial to the best interests of any undertaking or employer.

A TELEPHONE SERVICE METER IN 1880.

BY H. L. BAILEY.

(A paper read before the Convention of the National Telephone Exchange Association, U.S.A., in 1880, showing that even in those early days the anomalies of the flat rate were apparent).

THE correct determination of value received from a telephone company by a subscriber is by no means a simple matter when it has for its object the establishment of a system of rates which shall be at once equitable and universal in their application. Among the complexities which enter into such a generalisation are the following:—

1. The varied extent to which the different subscribers use their instruments and lines.

2. The differences of distance through which connections are made, whereby trunk lines are monopolised to a greater or less degree.

3. The lengths of lines from different subscribers to the district exchange; with relative costs of establishing district connection.

4. The varied character of the service rendered, owing to ineffective connections, arising from imperfections of instruments or their adjustment, occupancy at the time being by other subscribers of lines call for; and in the larger cities, where the difficulties of construction are comparatively great, and where there is such an intricate maze of wires, the frequency of crossed lines is an item for serious consideration. Thus, as the length of lines between subscribers and the district exchanges, with relative cost of maintenance, is subject to great variation, and the number of connections effected by different subscribers will vary from 25 to 1,200

per month, any definite universal rate per year, month, or week is manifestly inequitable, and will certainly restrict the largest profitable extension of business.

The continued and varied observations of telephone systems in New York, with a knowledge of the well-known facts which I have just presented, suggested to me the idea of automatically registering the actual service rendered by the companies to each subscriber. The expediency and ease with which it may be applied to different instruments and systems I trust will be apparent.

In the first efforts I canvassed the question of a meter attachment to the call mechanism of different telephone sets, but experience in matters pertaining to telephone service almost immediately condemned its practicability. The registration of calls would not accomplish the object sought, as many calls that are made prove abortive and do not result in effecting the desired connections, a registration of which must be accomplished as a first step toward the solution of the problem.

Among subscribers finding a fixed rate charged against them for each connection there would naturally exist a tendency to transact the maximum amount of business at each connection, which, by monopoly of trunk wires and service of central office operators for a relatively greater length of time, would increase the cost of such connections to the company. Therefore time enters as an important element and its registration as a second step.

The fact that a subscriber, seeing for himself a registry of the service he receives would be infinitely more satisfied than by trusting to his recollection presents as a third step the advisability of placing the meter at his telephone rather than at the central office. But then it is evident that the central office should be cognisant of the correctness of the registry, and have it so under control that any dishonest attempt on the part of the subscriber could be at once met by refusing connection or cutting him off.

Finally, the problem would be solved by an instrument simple in construction, easy of access for inspection, and of little or no liability to derangement, the function of which, in combination with a system, would fulfil the requirements in the four preceding paragraphs.

To a description of such an instrument and system I have the pleasure of calling your attention, and had hoped to exhibit the same in actual operation at this time, but delay in its completion has prevented me from doing so.

The telephone service meter (for as such I designate the instrument in question), although admitting of varied adaptation, I have for convenience attached to one of the push-magneto outfits such as are at present in use by the Metropolitan Telephone & Telegraph Company of New York, and shall here describe it as so applied. It consists of a suitable case containing the mechanism, clamped and hinged over the face of the push-magneto-box, concealing the push-button of the same. Its anterior face exhibits a crank with two stops, and a slot through which the figures indicating the number of connections are exposed.

Extending from the right lateral surface of the meter case is the dial of a calendar clock, upon which is registered the aggregate time of all connections for any given period. The internal mechanism consists of the necessary shafts, wheels, cams, etc., for the accomplishment of the following operations for each revolution of the crank:—

1. The registry of a single count by the meter mechanism.
2. The actuation of the clock movement at the first half revolution, and the stoppage of the same at the completion.
3. The automatic winding of the clock.
4. The rendering of certain sounds, which shall notify the central office of proper registration.
5. The control of the circuits so as to accomplish the notification to central office of the above, and also through modification to enlarge the adaptability of the meter to different systems.
6. The automatic indication to central office when the subscriber shall have finished.

As to capacity, the meter will register numerically 10,000 connections and 43,000 minutes, which would seem to meet all requirements, at least for monthly inspections.

The system consists simply in the central office operator requesting the subscriber to register at the time of connecting him with the party called for, and should the desired connection involve the use of long lines—such as to an adjacent town—the subscriber would be told to register two, three or four times, and in this case also the operator would be cognisant of its correct performance. By this method there would be no registration without actual connection, and *vice versa*.

A slight modification of the meter would adapt it to private lines. In such case either party can call and be called, but must register in order to talk together; in this case both register.

The very considerable expense for stationery, and the large aggregate of time consumed by employees in the present toll systems, deserve serious consideration, and it is evident that a means of effecting a similar result automatically and in a thoroughly reliable manner is of great value.

I have been asked how it could be managed in cases where subscribers use their telephones infrequently; their aggregate tolls per month, based on a universal rate, would be too small to pay for putting in and maintaining their district connection. The answer is—by charging a certain amount per month on all instruments without regard to the amount of their use, in addition to the standard toll rate. In conclusion, I would state that the meter itself would furnish the necessary statistics for the calculation of a just and uniform standard rate and system of charges.

New York, Sept. 8, 1880.

TELEPHONES AT ASCOT RACE COURSE.

By J. S. T.

A FEW weeks ago an order was secured from the stewards of the Ascot Race Meeting for a system of telephones to connect the weighing room and the judge's box with the eight different starting gates, situated at various points on the course. A common circuit was used, branched out on posts near the starting points, a portable telephone being joined up as required. Permanent instruments have been fixed in the weighing room and judge's box, the object being to provide speedy means of communicating between the various points should any difficulty arise before the start of a race, and so avoid the long delay which had previously occurred in such circumstances.

The whole installation, which involved half a mile of new poling and a quarter of a mile of new underground cable, as well as making use of the Company's underground cables, which, as it happens, run round the three sides of Ascot Heath, was completed and tested a couple of days before the opening of the race meeting on June 16.

Curiously enough the start of the third race furnished an ideal opportunity for proving the resources of the new installation, and the following extract from the *Morning Leader* describes the circumstances, viz.:—

KICKING MATCH AT THE GATE.

Black Spot, who started favourite, finished second, and the French three-year-old, Magellan, also ran well. D'Orsay and Cuffs, while waiting for the barrier to go up, indulged in a kicking match, and D'Orsay got the worst of it, Cuffs' heels landing on his near foreleg and injuring him so severely that his number had to be withdrawn. The incident, deplorable as it was, served one good purpose, and that was to demonstrate the value of the telephone, which has just been established here, connecting the weighing room and the judge's box with each of the starting posts. There would have been a long delay till the permission of the stewards to take the number down had been obtained and the fact communicated to the starter, but all Mr. Willoughby had to do was to explain through the telephone what had happened, and by the same means instructions were given by the stewards to start the others without the injured horse.

NEWCASTLE SECTION OF INSTITUTE OF ELECTRICAL ENGINEERS.

We have to congratulate Mr. A. L. E. DRUMMOND, A.M.I.E.E., whose appointment as Vice-chairman of the Newcastle section of the Institution of Electrical Engineers was recorded on page 72 of our last volume, on his recent election as Chairman.

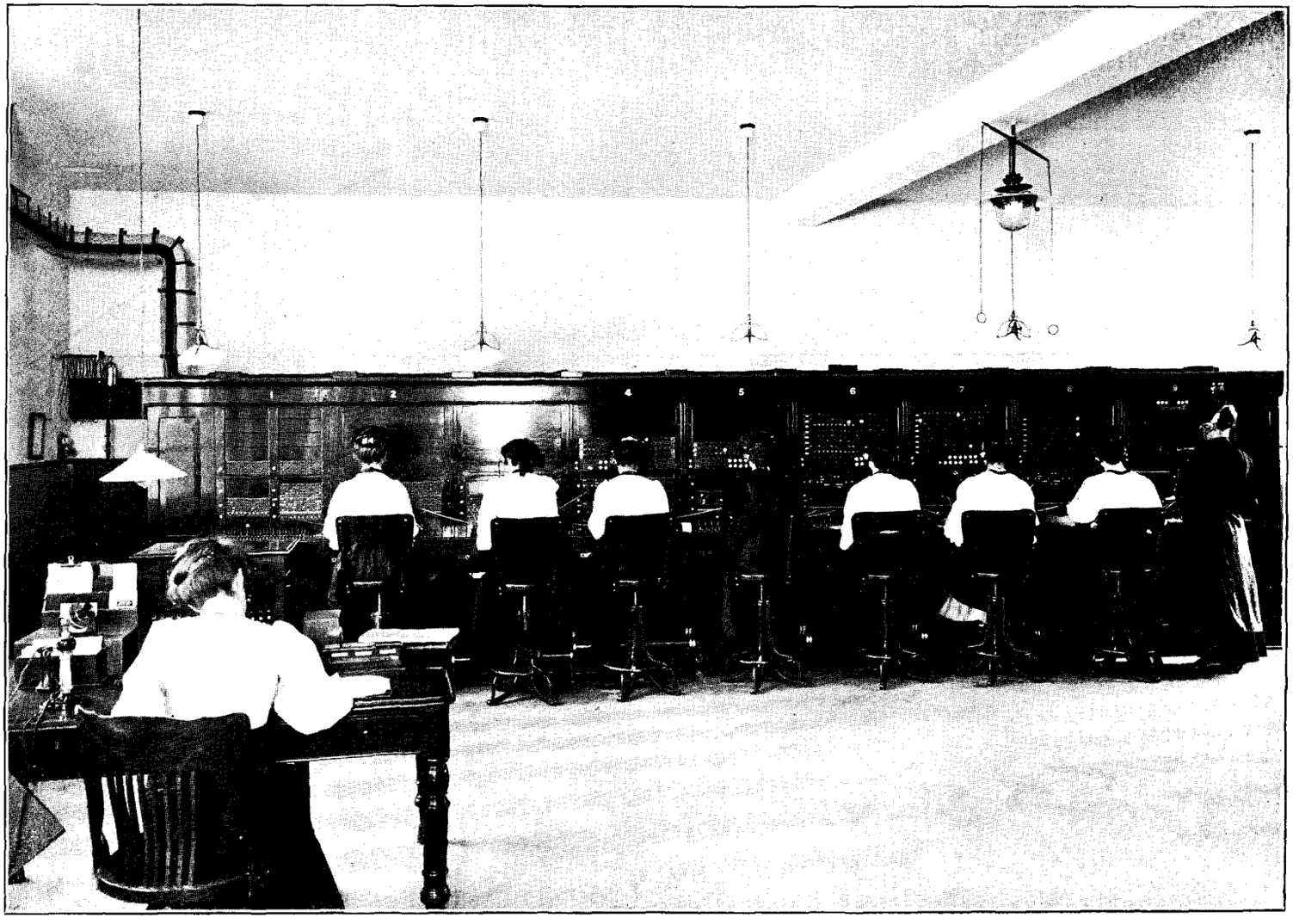


FIG. 1.—GENERAL VIEW OF SWITCHBOARD.

THE NEW CENTRAL BATTERY EXCHANGE AT TOTTENHAM, LONDON.

BY J. W. O. SANDELL, *Engineer-in-Chief's Staff.*

AT Tottenham, one of the northern suburbs of London, a central battery switchboard of the No. 9 type was brought into use on May 18 last; this equipment forms the third of its kind which London now possesses, two others being installed at East Ham and Enfield Exchanges respectively. Readers of the JOURNAL are no doubt familiar with the principal distinctive features of the No. 9 switchboard, which were summarised in an article in the February, 1907, issue.

The Tottenham Exchange premises were built for the Company and consist at present of a ground floor only, this having a floor space of approximately 3,000 square feet. The plan of the building showing the lay-out of the apparatus is seen in Fig. 3. The building is so designed that when the ultimate capacity of this switchboard, viz., 800 subscribers' lines, is reached additional floors can be added to allow of the installation of a central battery No. 1 equipment.

The outside cables are terminated on the vertical side of the main frame, which is of standard design; its capacity is 1,650 lines, viz., eleven uprights of 150 lines per upright, and the present equipment is for 1,500 outside lines.

Fig. 2 includes a portion of the main frame, in the rear of which is seen the charging generator, the power board, private branch exchange fuse panel and ringing machines. The charging set consists of a direct coupled motor generator, the latter giving 100 amperes at 45 volts on full load; a spare rotor and armature is supplied for this set to provide against a possible breakdown. The

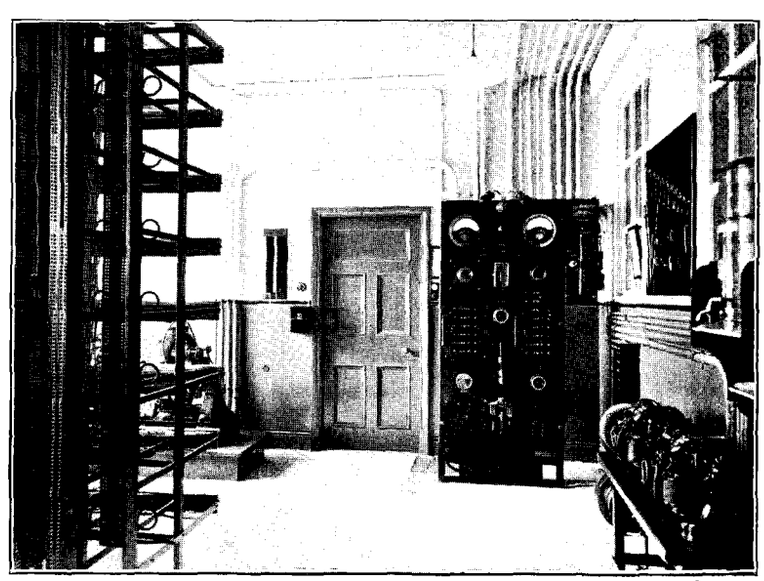


FIG. 2.—VIEW OF APPARATUS ROOM.

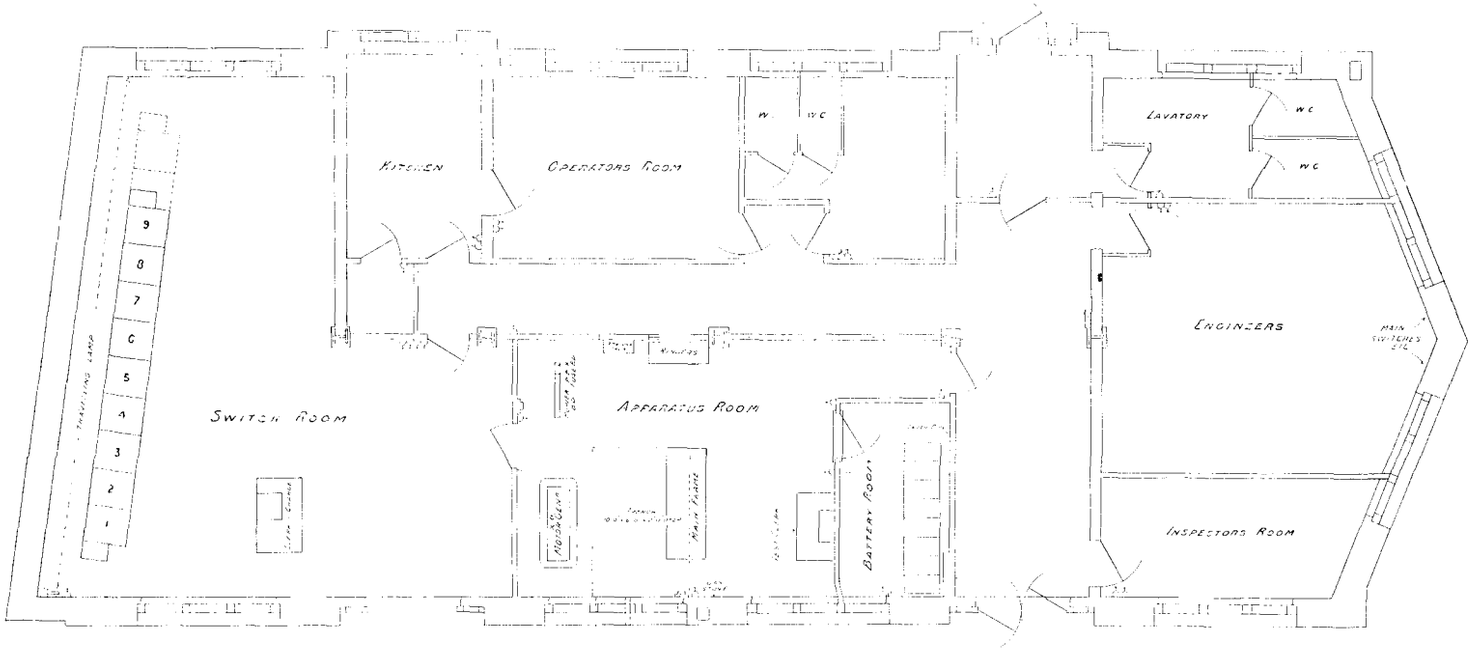


FIG. 3.—PLAN OF EXCHANGE BUILDINGS.

two ringing machines are both dynamotors which are supplied with current from the battery. The latter is made up of sixteen chloride cells in lead tanks which will accommodate plates sufficient to give a capacity of 780 ampere hours at a nine-hour discharge rate. The plates at present equipped have a capacity of 660 ampere hours.

Fig. 1 shows a general view of the switchboard, which comprises nine sections or operators' positions. The subscribers' and outgoing junction multiple jacks are multipled every four panels. Sections 1 to 3 inclusive are junction positions, and Nos. 4 to 9 are subscribers' positions, the ninth being used temporarily as an electrophone position. The junction positions have a capacity for 27 and are each equipped with 25 incoming junctions whose connections are virtually standard. The subscribers' positions each have a capacity for 200 subscribers' calling signals in strips of twenty which are mounted above the multiple or answering jacks. The present equipment of signals is 600 divided between five positions. A diagram of the subscribers' line circuit is shown in Fig. 4, and as the operation of the circuit is simplicity itself it needs no explanation from me.

The keyboard and plugshelf of each "A" position is equipped with the full number of cord circuits, viz., fifteen; the corresponding supervisory signals are fitted in two strips of fifteen each below the

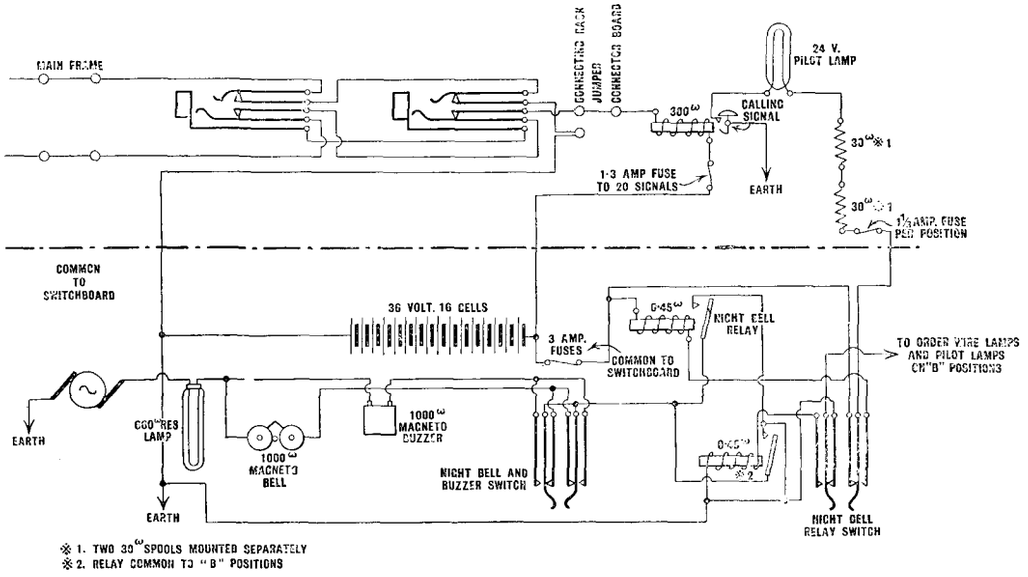


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FIG. 4.—DIAGRAM OF SUBSCRIBERS' LINE CIRCUIT.

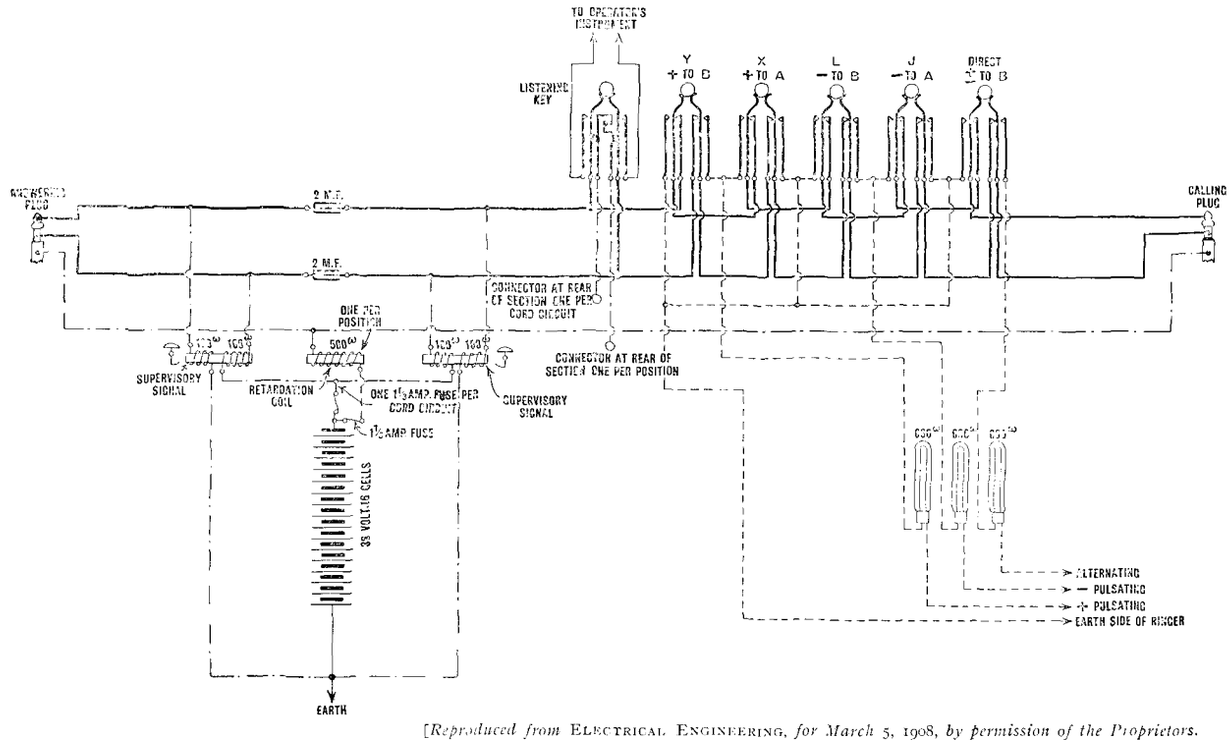

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FIG. 5.—DIAGRAM OF SUBSCRIBERS' OPERATORS' CORD CIRCUIT.

bottom strip of calling signals. The "A" operators' cord circuit is illustrated in Fig. 5, this again is self-explanatory; it will be noted that in fitting five ringing keys per cord circuit provision has been made for calling party line subscribers by means of the selective system of pulsating ringing currents.

Reverting to Fig. 3, it will be noticed the illustration shows the clerk-in-charge's table. This is fitted with a panel containing cast jacks wired to the operators' head sets, a connecting cord circuit and two speaking cord circuits, with the necessary listening and ringing keys, and also four jacks and indicators in connection with lines to the switchboard and test clerk.

The number of subscribers' lines changed over on the day of transfer was 410, and the number of incoming and outgoing junctions 83.

FEE ACCOUNTS DESPATCH.

BY MARION C. JAMIESON, *Calls Clerk, Glasgow.*

THE advantages of early despatch of Post Office fee accounts are generally recognised, and details of the procedure we have adopted to secure this may be interesting. Our method enables us to post the first batch—numbering about 700—on the evening of the second of the month following that in which the fees are incurred.

The accounts are balanced daily with the Post Office tickets, this being done in sections, and a note being kept of the daily total for each section. When the end of the month comes it is a comparatively easy matter to balance a few of these sections, enter the accounts in the journal, balance the journal with the accounts and send these off. Thus we are enabled to despatch the accounts in batches, instead of, as would otherwise be necessary, holding over all the accounts until balanced with the Post Office total.

In despatching the batches thus, we are of course taking the risk of a mistake being found in balancing with Post Office account, but in practice not one amended account has had to be sent to a subscriber.

The Post Office send us the tickets for each day's trunk calls two days after they have been passed—*i.e.*, the tickets for the first of the month are received on the third, those for the second on the fourth and so on. The work of posting is got well in hand about the middle of the month, and towards its close both posting and addressing of accounts are kept absolutely up to date.

For the last two days of the month the department's officials are good enough to give us the tickets one day earlier than usual. This enables us by the morning of the second to have the posting completed for the previous month. We are then ready to begin the work of adding the accounts and preparing them for despatch to the subscribers.

To further expedite the despatch of these accounts the girls in the Post Office Fee Department work late one night or a Saturday afternoon—the latter for preference. Late work is also put in by the lads attached to the Correspondence Department. In the month of May, for example, the second was a Saturday. The batch of accounts referred to was completed at five o'clock on that day; the lads came back at that hour and had the folding, stamping, etc., completed about 7.30 o'clock. This extra time is repaid by leave given at the slacker period of the month.

In conclusion I may say that the total number of Post Office fee accounts dealt with in Glasgow is about 7,000, and that the last batch is usually completed by the sixth of the month.

CAMBUSLANG ORPHANS' EXCURSION.

THE Cambuslang Orphan Children's Excursion Fund, says the *Glasgow Evening News*, has been well supported this year. The outing to Ettrick Bay on the last Saturday of May, was unique in that it had no connection with any church or other organisation whatever, and was given free to all children within the parish of Cambuslang, irrespective of sect or creed, who can claim to be orphans. The promoter is Mr. J R. Brown, a well-known official of the National Telephone Company in Glasgow, whose solicitude for the children of the poor is indeed remarkable. His schemes throughout the year include a New Year treat for orphans, an annual excursion to the seaside, a treat to message boys and girls, a Christmas party for orphans, and a flower service on behalf of city institutions. In addition, Mr. Brown is superintendent of the largest children's church in Lanarkshire, and is the founder of the Boys' Brigade in Cambuslang. He has been described as the "Barnardo of Lanarkshire," and locally he is best known as the "Children's Friend." Over 300 children participated in the trip, and the journey was so arranged that the orphans travelled by train, steamer and car.

TELEPHONE WOMEN.

XIX.—ALMA MARY FLUX.

IT is probably unique in the records of the staff that two sisters should be appointed Clerks-in-Charge of the principal exchanges in a district without previous service with the Company or practice in operating. Not only has this been the experience of the Misses FLUX, but each has filled the position entrusted to her with marked ability and success. Miss ALMA MARY FLUX, prior to joining the Company in 1899, held for some time a position of governess. Being selected to fill the position of Clerk-in-Charge at Cardiff, she underwent a short training at the Bristol Exchange, and it certainly required some considerable courage on her part to undertake the management of an exchange with over 1,000 subscribers and seventeen operators with so little experience. She at once showed that she was capable not only of coping with the work as far as operating was concerned, but with the more

ALMA MARY FLUX.

important human element. There is no doubt that her study and knowledge of character has materially assisted her in obtaining the esteem of those with whom she has come in contact. Cardiff Exchange now serves some 2,900 subscribers and has a staff of operators numbering 45. Those who have visited the exchange at Cardiff will understand the difficulties in the way of giving a smart service. The arrangement of the old magneto board is now, in view of the rapid development of telephony, far from ideal, and in addition to this there has always been keen Post Office competition in Cardiff. Miss FLUX has done an immense deal by her conciliatory manner and strong and able management to satisfy subscribers, and to obtain confidence while training a somewhat unruly public to adhere to the operating rules and regulations. The new central battery switchboard will shortly be fitted in the Post Office buildings, and to this switchboard will be transferred all lines on the central and three subsidiary exchanges. It can be well understood how eagerly Miss FLUX and her staff are looking forward to the time when they will have a modern equipment to deal with an ever-increasing traffic.

XX.—ELTA MAUDE FLUX.

MISS ELTA MAUDE FLUX was appointed Clerk-in-Charge at Newport in 1902, after a few weeks' training under her sister in Cardiff. She was more fortunate than her sister in that the Newport Exchange, which is in the Company's own premises, is

ELTA MAUDE FLUX.

equipped on more modern lines. It is only right to say that she has by her pleasant and conciliatory manner so won the esteem and confidence not only of her staff, but of the Company's subscribers, that complaints at this exchange are practically unknown. Like her sister, she has that cheerfulness of manner which endears the possessor to those who look to her for guidance and instruction.

OPERATING.*

BY ELLEN BOYLAN, *Monitor, Dublin.*

HAVING stated briefly the method of operating and the several rates of service, I will now say a word about the operator. While admitting that it is very necessary for an operator to be quick and expert, at the same time I consider that accuracy is one of the most essential qualifications, because, no matter how smart an operator may be, the result will not be very satisfactory to the service unless she is accurate as well, and I certainly think that the operator who is always steady and reliable will show much better work than the one who is, perhaps, smarter and seems to get through more, but whose results will not be at all so satisfactory to subscribers. Politeness and courtesy are also very necessary requirements in an operator, for no matter how unreasonable a subscriber may seem to be, she must always remember that he is not aware of the difficulties at the other end, and for this reason may be inclined to blame her unjustly; besides, she can always refer any difficulty of this kind to the monitors, who take all the trouble completely off her. It would be well for an operator to try and impress the subscriber with confidence that she is doing the best possible for him under the circumstances by a cheerful tone in answering and by willingness to get calls through satisfactorily as far as she can. I also certainly think that Miss DUGGAN'S suggestion of a dummy board—or one with not many subscribers on it, to enable learners to become trained in operating—should be adopted. It is also very essential that all apparatus, such as cords, keys, visuals, indicators, operators' instruments and, in fact, everything connected with the switchboard, should be kept in perfect order, as faults on any one of these may cause endless trouble to subscribers and also reflect on the operator when she is not, perhaps, in fault.

It might be well now to make a few remarks about the subscribers themselves, as they, in a good many cases, delay the operators unnecessarily through not carrying out the rules, viz., coming to the telephone without their numbers; not giving numbers

* Abridged from paper read before the Dublin Telephone Society.

promptly and so delaying the operator; hanging up the receiver before conversation is ended, thereby causing disconnection; not answering telephone promptly, etc. In this connection I may mention a case which came under my own notice. A certain subscriber rang up exchange, and was answered promptly by the operator "Number, please?" He replied by saying "Is that exchange?" The operator still said "Number, please?" when subscriber asked the same question again and again, till finally he was switched through to the monitor, who remonstrated with him for delaying the operator. His excuse was that as there were so many young ladies now in offices through the city, it was difficult to know if one were speaking to the exchange or not. He was told by the monitor that as no other office in the city but the exchange replied by "Number, please," he should at once have known that he was speaking to the exchange, and so have saved a loss of time both to himself and the operator. This is only one of the many ways in which subscribers delay the operators unnecessarily.

Public call offices are a continual source of worry and annoyance on account of callers who will not use common sense; putting in pennies before they ring up the exchange (some of them seem to think this has a magic effect in getting exchange); hanging up receiver while putting in penny; not turning buzzer handle; using bent pennies which stop box; ringing up exchange and then asking operator to wait until they get change, etc. All these things tend to retard the operating, and sometimes make observation tests show up badly, while a little more care and judgment on the part of the caller, together with a perusal of the instructions with which every call office is supplied, would go a long way to obviate all these delays.

With regard to team work, it is, I consider, very helpful to the operating, but necessitates a very efficient staff to carry it out properly; for as team work implies the helping out by each operator at a section of the work on that section, unless the operators are fairly proficient, the work may become somewhat excessive for the senior operator or more experienced junior. For instance, during luncheon hours and at times when the staff is reduced, a senior operator who is sharing a position with an inexperienced junior, a half-time operator or a learner, will necessarily have to take the lion's share of the work. After a time this will affect her operating by lessening her speed, perhaps causing bad tests for which she is not to blame. Supervisors are ever on the alert to combat difficulties of this kind, but no matter how quick or willing they may be to help an operator when they see her getting overloaded, it is sometimes hard to know where to turn for relief when they look round and see other operators in similar difficulties. Any complaints are always referred to monitors whose duty it is to smooth over difficulties and satisfy subscribers as far as possible—sometimes a difficult task as subscribers do not know nor understand all the complications from an operator's point of view, and what to them would seem trifles might be the cause of a lot of trouble, such as a false signal given by subscriber not operating switchboard or exchange extension properly, or ringing to bring back a subscriber who has gone away to look up information, and then wondering why he is cut off. These are some of the obstacles caused by subscribers who often rather from a want of knowledge than from a desire to blame any individual seem to be a little unreasonable in their complaints. I think that if subscribers answered their telephones more promptly and did not hold lines so long as to necessitate other subscribers being told "engaged" a number of times (a practice which obtains with a great many busy subscribers such as large commercial houses, shipping offices, railway companies, etc, where enquiries which entail time are necessary), it would be much better if the calling subscriber took his client's number and rang him up when the information was obtained. In this way a great many complaints caused by numbers being engaged would be considerably lessened, with satisfactory results to all concerned. Another source of trouble mainly due to the subscribers themselves is caused by those who have private branch exchange extensions, where the misuse of switches, plugs and other apparatus causes cutting off and other obstacles to service. It would be very beneficial to subscribers and to service generally if these connections were operated in the proper way by someone who understood them thoroughly in order to avoid some of the difficulties which they cause. It is very important that subscribers' instruments should be kept in good order and faults on lines cleared promptly. I feel sure that the test clerk and his staff do all in their power in this connection, although sometimes it happens that intermittent faults occur which are very hard to trace and which may be due in some cases to want of care in operating on the part of subscribers. I suppose you will say that I am inclined to rail over much at subscribers, but, having had some experience in dealing with them, I am of opinion that all these things tend in a great measure to slow down operating, and, as operators are bound to keep certain rules, it is only fair to expect that subscribers should do their share by paying attention to their rules. This is a matter in which, I am sorry to say, some of them are very deficient. In conclusion I would say that it would be a great help if some means were introduced whereby subscribers would be made to look up their numbers. The monitors' time is very much taken up uselessly looking up numbers for subscribers who do not or will not do it for themselves, and then become quite indignant if the monitor reminds them that they are not observing their rules and are consequently delaying the service. I will mention an instance of this. A subscriber rang up the exchange and gave a name but no number. The operator put him through to the monitor who found that he was giving the wrong name as well as not giving number. As the subscriber whom he wanted had long been connected, and his number was to be found even in an old list, she explained to him that he was not keeping the rules. This he immediately resented and told her she was most impertinent. She gave him the number desired and asked him to ring off and ask exchange for it. Apparently he called for the test clerk and complained that he got impertinence from the operator, but it was nothing to what he got from the enquiry office. This would show that the time which should really be given to subscribers' reasonable complaints by the monitors is frequently lost, and how it is often necessary to delay calls which should be answered promptly and dealt with satisfactorily.

AWARDS FOR INVENTIONS, SUGGESTIONS, ETC.

THE following awards have lately been made by the Company on the recommendation of the Education Committee for inventions and suggestions:—

	£	s.	d.
A. Magnall, Manchester, measuring rule for gang	2	0	0
A. Roberts, Liverpool, angle iron for fitting S.L. 1 and 2 mounted indicators on walls	2	0	0
R. Johnston, London, cupped pot-head joint	1	0	0
F. H. Copeland, Dover, method of finishing off wires on Leclanche battery zincs	2	0	0
H. E. Hayes, Head Office, improvement in bell gimlet or auger	2	0	0
H. Nichols, London, wiring of order wire test jacks on main frames	2	0	0
J. Horwood, London, tubular sleeves for labelling cables at distributing poles	0	10	0
W. E. Woodcock, London, brushes for motors	2	0	0
R. W. Hunt, Liverpool, stay splicing tool	2	0	0
J. R. Milnes, Head Office, gas governors	2	0	0
R. H. Hircoe, Leeds, new ruling for summary of calls book	2	0	0
Miss Duggan, Dublin, alteration to envelope enclosing operators' tickets	2	0	0
J. W. Fairhead, Norwich, junction calls on small exchanges	2	0	0
T. W. Hudson, Bradford, trunk and junction fee accounts	2	0	0
A. Stewart, Dundee, ready reckoner for private branch exchange calls	2	0	0
H. Wallace, Liverpool, clamp for jointing wire	2	0	0
W. E. Stiles, London, strap for cable leads, etc., on poles	0	10	0
P. Martin, Dundee, instrument cords	0	10	0
H. Eady, Jersey, cable sling	0	10	0
A. Warner, London, marking routine and supervisors' jacks at common battery exchanges	2	0	0
G. Gillmore, leading in from S.A. cups	2	0	0
A. E. Abbott, H. Peck, J. Stewart, London, order wire testing jacks on main frames	2	0	0
A. Batstone, Head Office, spring collar for retaining fibre sleeve on plugs	2	0	0
H. Martin, London, new pattern handles for call office cabinets	2	0	0
Miss Minter, London, towel racks	3	0	0
J. R. Milnes, Head Office, spring balance for brush adjustment	2	0	0
H. Sadler, London, testing electric light fittings for contact with frame	2	0	0
L. Price, Leicester, cable sling	0	10	0
W. Fox, Notts Factory, adjustment of ringers on Ericsson table sets	2	0	0
G. Bullimore, London, testing apparatus for numbering out working cables	2	0	0
J. B. Salmon, Leicester, extension bell working on party line instruments	2	0	0

IN LIGHTER VEIN.

By JOHN TULLOCH, *Chester.*

THE writer is obliged to Foreman TRANTER, of the Chester district, for the following anecdotes, showing the many different experiences which the men of the National Telephone Company, and especially those of the outside staff, are continually undergoing.

These experiences, amusing to read of now, but encountered, no doubt, with mixed feelings at the time, are but the records of actual facts, and seem to point to the conclusion that anyone taking upon himself the duties of a chronicler of telephonic studies in the lighter vein would be well rewarded for his efforts.

The first is an amusing account of an obstinate cable. An armoured cable lying in the bed of the River Dee and carrying important lines, suddenly developed a serious fault, in fact became quite "dead earth." A new cable was quickly run, or rather dropped, into the river, and the men commenced the work of recovering the old armoured cable.

The initial operations were of a very mild character, in fact, it was another instance of "three men in a boat." They evidently did not realise the stupendous nature of their task, for they attempted to haul up the cable hand over hand. They succeeded in raising about three yards out of 240 and soon gave up this method. One of the managers of a works near the river, and served by the cable, was watching the men at work. He appeared to take a great interest in it and offered to help by bringing a "donkey" engine, on the wharf, into play. To the accompaniment of much puffing and snorting the engine ran itself to a standstill, and the cable quietly subsided to its bed again. Not to be outdone, the manager then requisitioned the services of a steam crane which stood on the wharf near the end of the cable. More puffing and tugging ensued, and the cable nearly pulled the crane off the jetty, returning to its bed again without having turned a hair, or, rather, wire. It was then noticed that the works' manager was missing.

After several more ineffectual attempts had been made the men in the boat were about to give up the job as being an impossible one for them when they were hailed by the captain of a tug, who, seeing their difficulty, very kindly offered to give them, that is, the cable, a lift. The offer was accepted and our men went aboard the lugger. A hawser was hitched on to the end of the cable and the tug started off. It began to wobble rather unpleasantly and very soon the only comfortable and safe attitude for the erstwhile sailors was "on the knee"—clinging to the deck. About five minutes' tugging sufficed to strip the hawser into shreds and the captain's face was a picture. But he was not going to be outdone. Turning to the foreman he said "I'll shift it this time." To which object the pronoun referred we do not know, but in the light of after events the captain must have meant that he would shift the tug. At all events he gave orders for a 6-inch No. 2 rope to be made fast to the towing or hauling hook and to the cable. The tug was backed up stream a little and then started forward. One mighty pull, which must have strained the engine to the utmost, and the stern of the tug went down while the for'ard went up in the air, with our heroes clinging desperately to the edge, *trying to press it down!* To cut a long story short the cable proved itself master of the situation and had to be cut into sections and taken out in that way.

An incident occurred on an occasion when some work was being done for a baronet well-known in this district, which gave the chief actors therein a fright although they could afford to laugh when they afterwards found that there had been no cause for fear. Wires were being run across a lake in his grounds. A small boat was provided and James, the butler, was asked to assist them across. James evidently knew a thing or two and managed to excuse himself. The engineer and the foreman therefore decided to undertake the "voyage" on their own account. When about half-way across they became aware of a layer of water at the bottom of the boat. "I believe she's sprung a leak," exclaimed the engineer in an anxious whisper to the first mate—he could not swim. A close examination proved him to be correct. They pulled hurriedly for the shore hoping to reach it before the boat filled, but in vain. Filling rapidly, the boat suddenly sank beneath the waves—leaving the two men standing knee deep in water and soft mud. They *tramped* the remainder of the journey across the lake and the butler discreetly kept out of their way for the remainder of the day.

Sometimes amusing hints or suggestions are given in a friendly spirit by members of the public as to how certain things should be done, as was illustrated once at Oswestry. The gang were at work endeavouring to turn a large pole around a corner into a yard, which necessitated much scheming not provided for in technical books, and a gentleman who was looking on suggested, in all seriousness, that the men would get the pole in much more easily if they were to *cut a piece off the top*. Needless to say he was ignorant of the fact that the pole was the exact length required for clearance purposes, but his suggestion no doubt sounded strangely to the men.

An amusing incident occurred at Rhyl when the gang was stationed there on one occasion. This incident took place after the day's work was over and was not connected with the work of the Company, but as one of the gangmen—the same man who had the adventure with the miners—was the attraction on this occasion, the story does not suffer in any way. This man was in training for some athletic sports and on the Saturday afternoon after the work for the day had ceased—it was in the height of summer—he seized the opportunity to indulge in his amusement and arranged for a run, against time, from Rhyl to Rhuddlan Castle and back, a distance of about eight miles. The inhabitants got to hear of the event and crowds awaited his return—together with a policeman who had received orders to lock up the man for running in bathing costume. One of the gangmen in the crowd, hearing of the unpleasant surprise which was waiting for his companion, went on his bicycle to meet him and brought him into the town from another direction.

The final "recollection" happened in connection with the visit of the gang to one of the county asylums in this district. The men were running wires across the asylum grounds. A coil was on the drum barrow with a boy in attendance. About three spans had been run out when the men were brought suddenly to a standstill. Pulling and tugging proved of no avail; not another inch of wire was forthcoming. On seeking the cause of the trouble it was found that the boy in charge had decamped, leaving the drum in the possession of two of the inmates, one of whom was holding on to the drum like grim death—the other trying to cram the loose end of the wire into his trowser pocket. An attendant was brought and the inmates were relieved of their duties. The boy was restored to his post and the gangmen returned to continue their work, to find one of the men, whom they had left behind, up the ladder clinging desperately to the top of the pole, while below stood another inmate who was violently shaking the ladder, placing our man in a dangerous position. He was soon rescued and the whole gang must have felt very much relieved when the necessary work had been completed and they had left the scene.

One could fill the pages of the JOURNAL with accounts of incidents, amusing and otherwise, and all more or less interesting even to readers who do not share the work of the outside staff—exciting experiences while towing poles along the River Foryd at Rhyl (reminiscent of the Canadian lumberer), of the summary cessation of work in a field, owing to the appearance of an angry bull; perhaps, incidentally, causing the wages clerk some doubt as to whether "chased by a bull" was chargeable to capital or revenue; and many others—but the Editor's blue pencil is making its appearance and the curtain must be drawn.

BIRD'S NEST IN A UNIQUE POSITION.

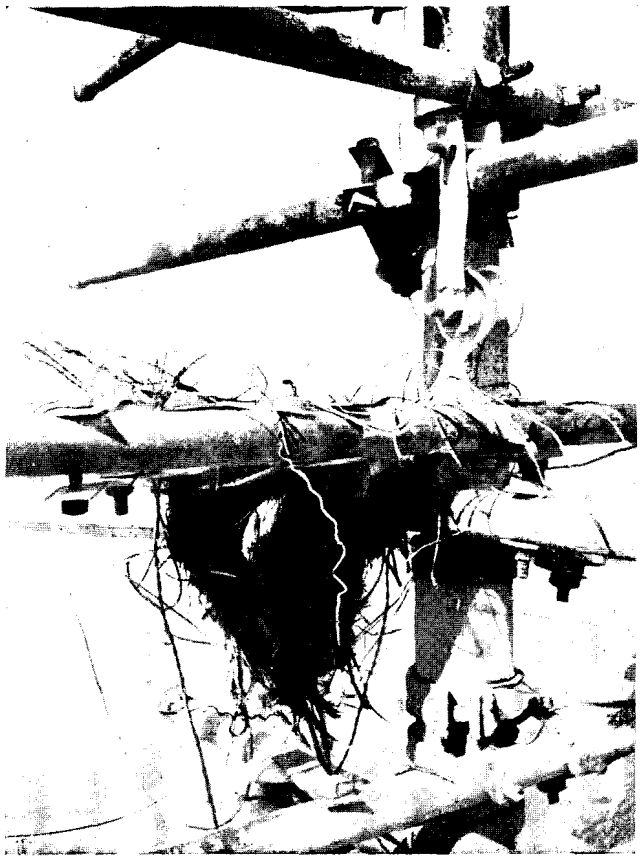
By A. C. JENNINGS, *Cairo.*

THE accompanying photo shows a raven's nest built on the derrick of Cairo Exchange. This bird is slightly larger than the English crow, and acts as a scavenger in most eastern towns, which it always frequents.

The nest when found contained five eggs and was ingeniously

constructed of fragments of iron line wire, scrap pieces of vulcanised indiarubber and office wire. The whole was neatly entwined and the inside lined with hair and pieces of sacking, etc.

It was built against one of the corner poles, across two lines, so that the wire strands of the nest were short circuiting the lines.



The Arab linesmen, who must have seen it, had left it quite undisturbed.

It would be interesting to know if any of the feathered tribe at home have the same audacity by using the Company's erections in this way.

SUCCESS IN LIFE AND BUSINESS.

BY J. F. COOTE, A.M.I.E.E., *Engineer-in-Chief's Department.*

SINCE the commencement of this JOURNAL, some two years ago, much has appeared in it on the way to attain success in the various branches of our work. Perhaps the most valuable of all these contributions is the very interesting and instructive article by Prof. V. KARAPETOFF, of Cornell University, which appeared in the issue of last September, wherein he discusses the subject in relation to the engineering profession, though much of what is said applies equally well to other departments of our business.

After enumerating the qualifications he considers necessary from the technical and commercial point of view, he proceeds to review the subject in its ethical aspects. Taking as the premises of his argument the necessity of some philosophy to co-ordinate all the efforts of the individual, and bidding his readers beware of any "canned religion"—a very picturesque Americanism by the way—he briefly outlines his own theory of life and its application, not as in any way laying down an inflexible code of thought but merely as a typical illustration of his meaning, leaving each one to fill in this portion for himself according to his own mental development and the standpoint from which he views life.

The necessity of some philosophy as a governing factor, if life is to be anything more than a succession of isolated acts, having no educative power over the individual himself or influence on his fellow-men, will be at once conceded by everyone who has thought at all on these matters; but in selecting a philosophy as the cementing material for the building up of his life, every man must see to it that he is really using cement and not something equivalent to that crumbling substance with which the modern jerry builder too frequently erects his edifices, or he will find, like the unfortunate purchaser of one of these deceptions, that his house will be very far from lasting out a lease of even three score years and ten. To the writer, who views life unreservedly from the standpoint of Christianity—which he is very far from regarding as a "canned religion"—that is the only philosophy which can adequately fulfil this purpose, but as everyone must settle this matter for himself, there is no need to further criticise the views expressed in the theory of life put forward by Prof. KARAPETOFF.

But there is another aspect of the question which seems in these days of high pressure living to be in great danger of being lost sight of. So complex has modern life become, so rapid and so exacting in its demands on both the mental and physical capacities, that the very keenness of the competition and the fear of being left behind in the race for success in business constitute in themselves a great temptation to forget that, however desirable such success may be, there is something of infinitely greater importance—success in life. The two are absolutely distinct, though they are too often entirely confused. They may sometimes be, possibly one might say often are, united, but this is far from being always the case, and men who have met with but scanty success in business may be found by those who know them to have attained a marked degree of success in respect to life; and conversely, those who are most successful in business are often great failures as far as life is concerned. This we can all probably verify without going beyond the circle of our own acquaintances.

Success in business, I suppose, we all aim at to the best of our several abilities, though in the nature of things we cannot all reach it, for it is not given to everyone to possess that mental capacity which is the essential requisite for rapid advancement. It must be remembered that there is a certain quality of brain inherent in every individual, and while education may do much to improve the power of thinking by systematic training, yet there are limits beyond which even education cannot go. And there is another limiting factor which frequently militates against success, the lack of that physical stamina which will enable a man not only to work at all hours of the day, but also a good many of the night, as he must often do if he is ever to hope to rise above the ordinary level. There is a remark attributed to one of our chief officials which well illustrates this, "A telephone man's hours are 24 per diem, except a Head Office man, and his are 25." That is the spirit of the age, but however willing the spirit may be, one is too often forced to recognise that the flesh is weak, and a man whose constitution will not stand these demands must be contented with an inferior position.

But whatever may be the cause in any particular case, it is unfortunately the lack of apparent success which does more than anything else to dishearten, and in so many instances eventually render inefficient numbers of men who would otherwise do more justice to themselves and materially increase the output and quality of work of a vast organisation like ours. Disappointed at their lack of success in business, they forget that they may, if they choose, still make a real success of their lives and they allow the forces which make for degeneration—so terribly powerful in most of us—to work unchecked, whereas if they only resolved that whether their efforts met with due recognition or not their work should be done to the best of the abilities they possessed, they would find in that alone a satisfaction which would, of itself, go a long way towards recompensing them for their apparent failure. For after all the real object of life is not the attainment of so-called success, but the formation of character, and only he, who behind all the outward circumstances of his material existence is conscious that he is patiently throwing aside day by day all defective material in the building up of his life and is slowly but surely raising a structure which will stand, only he can feel any true satisfaction with life and realise what WORDSWORTH expressed so well in one of the most beautiful of his sonnets—

> "We men, who in our morn of youth defied
> The elements, must vanish;—be it so!
> Enough, if something from our hands have power
> To live, and act, and serve the future hour;
> And if, as toward the silent land we go,
> Through love, through hope, and faith's transcendent dower,
> We feel that we are greater than we know."

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ACROSS THE CHANNEL.

"THEY do these things better in France" was a favourite saying of our forefathers. In those days perhaps there were a good many things that they did better in France; in these days perhaps there are still some—but telephony is certainly not one of them. From all accounts the French public, that is, the Paris public, for in this case it is particularly true that Paris is France as outside of Paris there are few telephones in France, is thoroughly exasperated by the continued inefficiency of the telephone service. There has been a "telephone crisis" in Paris for a good many years past and it has lately reached a particularly acute stage, owing to several causes which are worthy of a word or two of comment. At the present time there is a furious Press campaign waging against the French Post Office, in which the politest of all languages is used to direct very impolite remarks bearing on the conduct of the telephone administration, while indignation meetings of subscribers are being held in various parts of Paris at which even more impolite and emphatic remarks are made than can well be put in print. The Under-Secretary of State has been moved to make a four-hour journey to Brussels in order to inspect a complete central battery system really at work, and, as we note in another column, a Committee of the Chamber of Deputies has devoted an afternoon to a hearing of the grievances of the Paris telephone users and of the remedies proposed by the Association of Telephone Subscribers—a society which for several years has persistently pressed those grievances on the somewhat unsympathetic attention of the responsible officials.

The spectacle of this intense state of telephonic unrest across the Channel has its interesting phases for us on this side, because for nearly twenty years the telephone in France has been administered by the State, and there are apparently many in this country who believe that a sort of telephonic millennium will be reached when the entire telephone service here passes under State control. So far as one can judge from the many articles on the state of the telephone service which have appeared recently in the French Press, and from the arguments put forward by the Association of Telephone Subscribers, the difficulties which beset the French telephone service are those which more or less beset every State administration of a growing technical service—lack of capital, lack of expert administration, lack of specially trained staff, lack of that commercial spirit of enterprise which impels improvement and development.

The agitation in Paris is not due to any question of tariff, though the adoption of the measured rate tariff is frequently urged on the French Post Office as a much needed reform; it is an agitation based entirely on the continued inefficiency of the service, which has apparently got into such a hopeless state that nothing short of a complete re-equipment of the system and reorganisation of the staff can produce an effective remedy. The re-equipment of the system with central battery apparatus, which was promised some time ago, is just beginning to take effect, but the first central battery exchange to be brought into service has been a severe disappointment, and the cases of bad service have been so numerous as to give rise to one of the indignation meetings referred to above. This seems surprising, but it is accounted for by the fact that the French Administration, while converting the exchange apparatus to central battery, have retained in service the old subscribers' instruments, which are of a large number of different types. It will be clear to experienced telephone men that if it is intended to convert the whole Paris system, of some 60,000 stations, to central battery working in this fashion the last state will be worse than the first.

Added to this bad experience with the first large exchange converted to central battery there comes the realisation of the utter inadequacy of the financial proposals of the French Post Office with respect to the re-equipment and development of the telephone service generally. The Money Bill which is to be discussed by the French Chamber this month calls for a total expenditure of £1,600,000, to be spread over six years; this relatively small sum is to provide new exchanges and new equipment for the rest of France as well as for Paris, and a quarter of the total, or £400,000, is for new trunk lines. It is clear that such provision of capital is quite inadequate for the telephonic needs of a great commercial country. If the Paris system were to be rebuilt and enlarged quickly, and if an active development generally were to be made the policy of the French Telephone Administration, at least as much capital could be well spent every year for several years to come as it is proposed to spend in the next six years.

The telephonic evils of France, which are undoubtedly real and crying evils, are not referred to here simply for the sake of showing that in at least one Continental country there is not the telephonic paradise which our Chamber of Commerce friends are in the habit of telling us exists all over the Continent. The French telephonic situation is an interesting illustration of the evils resulting from the usual Government policy of making the telephone service an insignificant branch of a Government department. The telephone service, with adequate management and adequate resources, can be made in every industrial country one of the greatest of the electrical industries; it can give good employment to vast sums of capital and to large bodies of skilled workers, and, properly organised and administered, it can furnish to the entire

community the most useful and valuable means of communication at a distance yet devised. But submerged and shackled as a sub-department of a department of the unwieldy machine of State it can do none of these things. The French public, having learned this by bitter experience, is now clamouring for a return of the telephone service from State to commercial management.

HULL, GLASGOW AND THE REST.

AN announcement in the Press that the Hull Corporation telephones earned a profit of upwards of £1,000 last year has moved the few remaining supporters of municipal telephony to somewhat chastened jubilation over this apparently successful result; although, as Mr. LAWS WEBB points out in a letter to the *Electrical Engineer*, this prosperity is absolutely unreal, gained as it is by the free use of the National Company's fourfold greater plant for intercommunication purposes.

We do not, however, grudge them this simulacrum of success; but when the *Municipal Journal* complains that the supporters of the National Telephone Company and the Post Office have always declared Mr. BENNETT'S estimates to be wrong, and states that the facts as revealed by a proper understanding of the various corporation accounts are eloquent to the contrary, we feel compelled to point out the "facts as revealed" are even more eloquent in the other direction. By a curious coincidence the Glasgow papers bearing the same date as the *Municipal Journal* contain accounts of the last sad scene of all in connection with the municipal telephone fiasco in that city, viz., the application of the revenues of the Common Good to meet the loss of £16,000 sustained by the sale of the system to the Government. In the Glasgow area, with its population of a million, was established the only municipal telephone undertaking of any real magnitude. The story of its loudly heralded inception, gradual loss of ground, final absolute stagnation and sale to the Post Office is now ancient history, but that the cost of connecting each subscriber ultimately worked out at fully double the originally estimated figure is not forgotten. In the year following the Brighton municipal system collapsed, the original estimate per subscriber being exceeded in this case by about 40 per cent. There is no need to add to these instances of the reliability of the figures upon which the corporations founded their ephemeral exchanges, but the eloquent paragraphs in the Glasgow papers come as a salutary corrective to remind municipal telephone enthusiasts of facts which they seem to be in danger of forgetting.

FALSE FIRE ALARMS.

A PERSON with an erratic and perverted sense of humour was the other day convicted of ringing up the fire brigade from a telephone call office and giving a false alarm of fire. The magistrate in sentencing the offender to pay a fine of £20 or go to prison for two months characterised his action as "senseless and wicked." He also expressed his opinion that the punishment was wholly inadequate. During the present year no fewer than 271 firemen, 31 steamers and about twenty horse and other escapes have been called out by these false alarms.

The abuse of an immense convenience and source of public safety, such as the telephone in its capacity of fire alarm, cannot be sufficiently reprehended; its continuance might very conceivably react prejudicially on the usefulness of this accessible and prompt form of signal. The fact that every call office is a ready-made auxiliary public fire alarm, and that, still more, every subscriber's instrument can be made the means of an immediate summons to the brigade from the very seat of the fire must make enormously for increased immunity from the danger of death and destruction by burning. The wilful misuse, therefore, of such a benefit is a singularly poor species of fun, and it is to be hoped that the delights of sending a fire engine on a wild-goose chase will prove an insufficient compensation for a couple of months in gaol.

There is a possibility that the man's intention was malicious, and that his action was inspired by dislike of some member or members of the fire brigade; but more probably it was conceived in that spirit which finds distraction in sitting down on silk hats or removing chairs from behind people about to seat themselves. Recreations of this sort, which amount to bad taste even when indulged in on a small scale, become serious misdemeanours inimical to the general safety when they take the form of abusing public institutions. It is well that they should be sharply dealt with, and there is no doubt that the sentence passed on the offender in the present case will act as a check upon this especially senseless form of folly.

GAINE MEMORIAL PORTRAIT.

THERE are still two or three copies of this portrait left. Anyone desirous of obtaining one should make early application.

HIC ET UBIQUE.

ACCORDING to a writer in the *American Telephone Journal* there are few calls in the smaller towns lost on account of the subscriber not answering his telephone, because the intelligent operator always knows where her subscribers can be found at various hours. This convenience must have its drawbacks. One conjures up visions of the subscriber skilfully avoiding his office telephone at the hour when some bore or other enemy is likely to ring him up, tracked by the relentless operator to the house of some friend or some public place which he is known to frequent.

WE publish in another column a paper on "A Telephone Service Meter," read in 1880 at a convention of the National Telephone Exchange Association in the United States, which is of great interest as showing that nearly 30 years ago, in the very early days of telephony, the inequitable nature of the flat rate was beginning to be appreciated, and its tendency to restrict development was already foreseen. The meter in question was designed to be fitted in the subscriber's office, but modern practice has found it more satisfactory to instal the counting apparatus at the exchange, where it can only be operated when the call is effective.

A little more than 100 years ago the celebrated French scientist Monge, who accompanied Bonaparte to Egypt, was considerably puzzled by the discovery in the Temple of Mehemet-Abn, in Upper Egypt, of coils of wiring which lay—and had probably been lying for ages—in a small stone chamber, and, tangled among them, several ivory and bone objects which resembled our common drinking horns.

On his arrival at the pyramid of Gizeh he discovered in a vault of about the same dimensions more coils of wiring matter, with similar ivory and bone horns. The telephone was then undiscovered, and, naturally enough, Monge did not understand the nature of his discovery, which has since, says M. Pacory, been shown to have been nothing else but a primitive telephone.

The instrument is said to have been in use in the days of the Pharaohs. It was naturally a very simple contrivance much resembling our toy telephones—and did not cover a distance greater than two or three miles. Tacitus tells us that when Antony went ashore after the battle of Actium he was accompanied only by a captain of his guard. Since all others had deserted him, it is not

unlikely, says the Frenchman, that he telephoned to the fair daughter of the Pharaohs, asking her to come and comfort him in his last agony.

Thus far the *Boston Herald*. It is all very pretty, but we think it requires amplification.

"'Tis not unlikely" Cæsar, when
He crossed the Rubicon,
Jacta est alea, cried; and then
Rang up for Roma, two-eight-ten,
And said, "I'm coming on."

'Tis possible Mark Antony
To Brutus telephoned:
"We'll meet again at Phillipi!"
Hung the receiver up on high,
And Brutus inly groaned.

'Tis not unlikely—in the sense
Of Pressmen's likelihood—
Indeed, in that past-perfect tense,
The probability's immense
The speaking was not good.

'Tis not unlikely, we surmise
(And let historians scoff),
Antonius sadly did advise
The daughter of the Ptolemies
How he had been cut off.

Cut off at Actium; now perplexed,
Perhaps, by faulty cord,
Cut off from Cleopatra next,
How shall we wonder if, much vexed,
He fell upon his sword.—W. H. G.

THE TELEPHONE SERVICE IN FRANCE.

IN Paris the agitation caused by the inefficiency of the telephone service continues to find expression in the Press and in public meetings of protest. The Association of Telephone Subscribers, organised four years ago to voice the complaints of the exasperated telephone users, has recently circulated a petition to Parliament calling the attention of the Government to the many defects of the present telephone service and praying either for a complete reorganisation of the telephone branch of the French Post Office, or, failing that, for the return of the telephone service to private enterprise, from which it was taken by the Government nearly twenty years ago.

The new central battery exchange in the Passy district of Paris has increased the volume of public complaint against the telephone service; owing to the mistaken policy of the French Administration in maintaining in service the old instruments at the subscribers' stations, which are of a variety of types and are not adapted to central battery working, the service of the new exchange is even worse than that of the old.

The interest of Parliament having been aroused by the intensity and persistence of the public complaints against the telephone service, a Parliamentary Committee of members of the Chamber of Deputies for the various divisions of Paris last week invited the Council of the Association of Telephone Subscribers to attend the Committee, with a view to giving detailed information regarding the existing difficulties with the telephone service. At this meeting the Association of Telephone Subscribers was represented by the Marquis DE MONTEBELLO (President), Mr. ARCHDEACON (Vice-President), and Mr. H. LAWS WEBB (Consulting Engineer to the Association). The Parliamentary Committee, presided over by M. GEORGES BERRY, consisted of some fifteen members representing various divisions of Paris, who gave a sympathetic hearing to the case for the telephone-using public. Mr. DE MONTEBELLO explained that the principal difficulties arose from the fact that the telephone service is at present operated merely as a branch of the Postal and Telegraph Administration, and he urged that for efficient working it was necessary to organise the telephone service as a separate department in all respects. A complete reform was necessary not only in the technical methods of the telephone administration, which had been allowed to fall far behind the times, but also in the selection and training of the staff, in the general business administration of the department, and in its financial management. Mr. ARCHDEACON followed along the same lines and gave examples of the disorganisation at present existing among the staff of the telephone branch of the French Post Office, and quoted figures showing the greatly higher development of the telephone in the other principal European countries, and the more favourable tariffs for telephone service which are offered to the public of other countries. Mr. LAWS WEBB explained to the Committee the essential difference between the telephone service and the postal and telegraph services, and pointed out that for an efficient city telephone service uniformity of plant and special training of the staff are essential requisites. He confirmed the arguments of Messrs. DE MONTEBELLO and ARCHDEACON to the effect that no serious progress could be made with the telephone service in France until the service was placed in charge of a separate telephone department, with a special staff and organisation devoted exclusively to telephone work.

The Committee asked numerous questions of the deputation, and several members made short speeches in which, while strongly opposing the suggestion that the French telephone service should be handed back to private enterprise, they stated that they fully agreed with the views of the deputation that the telephone branch of the French Post Office should be entirely reformed and should be organised and conducted on the same lines as a commercial concern. Members of the Committee themselves complained very forcibly that they were unable, as matters were now conducted, to obtain any figures or information giving precise data of the results of the telephone branch of the French Post Office; the Administration did not know itself what it was doing so far as finance was concerned. The Committee unanimously promised to support the Association of Telephone Subscribers and to take the matter up actively in Parliament, with the object of securing the appointment of a Special Commission of members of the Chamber and representatives of the telephone subscribers, for the purpose of making a thorough investigation of the difficulties under which the French telephone service now labours.

PRODIGALITY IN CORRESPONDENCE.

BY P. H. C. PRENTICE.

ANYONE dealing regularly with much of our official correspondence might well be struck with the liberality with which one officer writes to another, the desire almost appearing not to say the least, but the most, possible. I am speaking, of course, of the common everyday inter-official memorandum which constitutes by far the largest portion of our correspondence, and not of letters to the public.

I will give two simple illustrations of a most common failing, that which prompts the writer to carefully repeat the gist of his correspondent's letter, as if no copy or recollection of the latter was existent.

The memorandum originating the first matter was as follows (all the extracts given come from letters which have actually passed):—

> "I agree to this extension being carried out as shown on the enclosed plan, which please return when you have noted same."

This is the reply:

> "I am in receipt of your memo. of the 30th ulto., and note that you agree to the above extension being carried out in accordance with your amendments shown on the plan enclosed, and this plan I herewith return as requested."

The other reply I will quote runs:

> "In reply to yours of the 2nd inst., respecting the position of affairs as regards the above Suppliers having had a quantity of Stores ready for inspection for several weeks, I would report . . ."

I think everyone will agree that both these specimens of replies are examples of so much waste, in the former—which is a complete memorandum—there being about 60 per cent. of verbiage, and, in the latter, the superfluous words reaching 16 per cent. on the total in the memorandum.

Here is a sample of redundancy in a slightly different form:

"With reference to your letter of yesterday, I would ask reference please to my letter of the 30th January last, and the latter portion of it, wherein I stated that . . ."

This waste of words speaks for itself.

Now take the simple case which is met in every memorandum, viz., the reference to a previous letter. Most commonly the formula is "With reference to your memo. of yesterday's date," the least common (the shortest) "Yours of yesterday," between these two we get such sentences as:

"Your favour of yesterday's date safely to hand."

"I am in receipt of your memo. of yesterday's date."

"I beg leave to acknowledge receipt of your letter of yesterday's date."

"Your letter of yesterday's date duly to hand, and I have noted the contents."

It is strange what an aversion there is to the use of the fewest words in "Yours of yesterday," but it is safe to say that for one user of this phrase there are twenty who use one of the fuller expressions.

There is no doubt whatever, however accustomed we may be to the use of old-time ornamental phraseology, which is really meaningless, that our ends, so far as our ordinary official memorandum is concerned, would not only be as well, but better, served by the relinquishment of all wording that has no direct value. In this particular case, even the unfavoured minimum of "Yours of ——" can be improved upon. Below is shown a simple arrangement for use at the head of service memoranda devised by the writer with a view to systematising as far as possible the usual reference matter, reducing it to a minimum, and so enabling the actual subject matter to be got at quickly.

YOUR		OUR	
Letter dated.	Reference.	Letter dated.	Reference.

The form is so simple as almost to speak for itself, but I give an illustration of the working. In replying to a memorandum, the first, second and fourth columns are used. In writing, not a reply, but a memorandum further to one which has been previously sent, the third and fourth columns are made use of.

The collection together in one place of these data as to references will be found better than having them scattered about.

Incidentally, the word "Enclosure" is often printed at the head of the paper, but there is probably no saving in this, as generally the typist is unaware of any enclosures until a certain amount of the memorandum has been typed, and there is waste in turning back or reinserting the paper in order to make use of the space provided. I think the best and cheapest plan will be found to be the typing of "Enclosure" at the end of the memorandum.

References have to be quoted, and if given with the date of the letter referred to as described, the usual introductory matter of from three to thirteen words can be dispensed with, for it should be a rule, under ordinary conditions, not to write that a letter is "safely to hand," or that one has "duly noted its contents," as the assumption must be that the letter does reach the addressee safely and that he heeds what you have told him, not the contrary.

We are adopting the reference arrangement described in the Engineer-in-Chief's Department for all ordinary service purposes, and I suggest that the general adoption of this method throughout our system would certainly tend to economy and, I believe, to increased efficiency also.

Generally speaking, undue liberality with words does not conduce to plainness in conveying one's meaning, and it is extraordinary to note the vagueness and indirectness in the correspondence received day by day. So many men from their letters seem to possess a rooted objection to a direct answer to a simple question. It is, of course, not that they object, but because they do not focus the mind's eye on the question put and give the answer so as best to help the enquirer. Thus, through a sort of mental astigmatism, a loose system of thought and a loose style of expressing that thought results, and consequent upon this an all round waste which might be averted by a little proper consideration.

Here is an illustration of a simple question and the indirect reply I refer to—

Q.—"There being a variation between figures on Return A and Return B, is the difference accounted for by C?"

A.—"The figures on Return B are correct."

The implication appeared to be "Yes" as the answer, but it was uncertain; consequently another letter had to be written, necessitating a further reply.

I will give another example, but the reply is rather more than indirect, being really no answer at all—

Q.—"How is test made?"

A.—"This is a new exchange and only two tests have been made."

It must not be imagined that I have been at any pains to find these examples; they are but a few out of many which happened to be at hand.

It may be thought that all these matters are trivial and scarcely worthy of consideration, but this is quite an incorrect impression. What drew my own attention more particularly to the matter of superfluous writing was an investigation made in the Engineer-in-Chief's office into the cost of a letter.

Of course everyone knows that a letter or anything else costs something, however small, but until analysis is made and all the facts are carefully weighed the seriousness of a collection of things, perhaps all small individually, can scarcely ever be recognised as it should be. Recently out of curiosity I analysed a number of letters received from the point of view of superfluous wording, and the result of the experiment was that about 20 per cent. of the average memorandum was redundant.

On the basis of the cost of an outward letter at 5*d.*, and deducting postage and other items not affected by a saving in words, I found that about ·6*d.* was the dead charge thereon for unnecessary wording.

This ·6*d.* per letter multiplied by the total letters passing per annum, or even per month or per week, gives something that we might well save, a calculation showing that many hundreds of pounds are involved annually.

In the case of special reports or of letters to the outside world obviously it may be requisite to conform to the current style of address, but this note is chiefly concerned with the inter-official communication, and I will summarise in conclusion a few points which are useful to keep in mind in writing ordinarily—

Concentrate the mind on the real question at issue, and give as far as possible a direct answer to a question. Or in seeking information endeavour to make your enquiry complete in itself so as to avoid a supplemental one.

Let your style be the briefest and least ornamental. It is simply a business memorandum, not an essay, and only bare facts are wanted.

Get rid of conventional phrases and substitute some simple arrangement as mentioned. Avoid such expressions as "I beg leave to report that," and instead start and report at once. It is not an act of kindness to receive a business report, but a duty for which one is paid.

In a lengthy memorandum, instead of starting paragraphs such as "With reference to the question of pencils," use a sub-heading thus, "Pencils," and economise the six other words.

It will usually pay to get a constantly recurring memorandum printed with the necessary blanks, rather than have it typed each time afresh.

By condensing matter as much as possible, by avoiding repetition, indirectness and obscurity of expression a saving is effected not only in your own but in others' time, and more and better business can be done generally.

A FEW NOTES ON NEW MEASURED RATES.

By J. R. BROWN, *Contract Manager, Glasgow.*

So much has been said and written on our new rates that one feels verging almost on boredom in referring to them again.

The new tariff is the subject nearest the tongue, and I daresay the pen too, of every Contract Department man. It is the topic he

most frequently discusses, and notwithstanding all that has been said on the subject a few notes as to how the new rates were inaugurated in Glasgow district and the reception they are getting from the public may be of interest to the readers of the JOURNAL.

The rates and altered conditions introduced in July, 1907, differed in many respects from those previously in force, and officers had much to forget as well as much to learn. When one has been accustomed for a number of years to a given track the getting out of that track is about as difficult as making a new one.

The withdrawal of the unlimited rates on both exclusive and party lines; the withdrawal also of the old exclusive measured rates and the substitution of a tariff built on an equitable basis, were the points officers had to be primed on and be prepared to discuss with a doubting public.

In order to give them a thorough grounding in the altered conditions the Contract Department staff came back two nights a week for three weeks and the new rates were gone over in detail. At the end of the course a series of 28 questions was prepared and handed to the officers, which they were asked to answer in writing without help before leaving the table. So much enthusiasm was evinced that it spread to other departments, and several nights were given to those on similar lines. It was found that the time was well spent, and the "heckling" at the close of each lecture brought out points from individual departments which were of value to all.

The public had then to be tackled, and it was at this point that the contract officers found the value of the lectures and the value of the information they had acquired. Officers soon got familiar with the rates; familiarity with them brought conviction of the broad businesslike basis on which they had been built, and conviction brought courage and persistency.

With the measured rate for businesses there was not much difficulty. A slight reduction in the number of calls was compensated for by the increased facility of being able to communicate with Post Office (late Corporation) subscribers.

Few, if any, of our prospective subscribers complain of the measured rates being dear. If they do not take service it is because they "cannot afford it," "do not need it," or for some other such reason, but seldom or never do they refuse because the price asked is too high for the service offered.

We are hopeful of the effect of the new rates on new business in future, and while there may be an occasional disappointment on the part of someone who is unable to get a cheap party line, the rapidity with which the public is accommodating itself to the new state of things is decidedly encouraging.

When, however, the question of flat rate happens to be raised by a prospective subscriber, it is usually a simple matter to show the fairness of each subscriber paying according to the service he gets. To point a prospective subscriber to his own wares and ask him if he would give an unlimited supply for a given sum usually disposes of the case, because the argument is unanswerable.

Our greatest difficulty has been with people who have been accustomed to make a large use of the telephone at the flat rate, and with existing flat rate subscribers wishing an additional line. They cannot see why a system which has suited them so well should be disturbed. They have been able to use the telephone *ad lib.* and, in some cases, give the use of it to their friends and customers. It has been a very cheap and handy commodity to them and the questions of the growth of the system, and the consequent increased value to them, or the unfairness and inequity of the charge never enter into their calculations. When we ask that their new or additional lines be put on a proper basis, and even point out how the whole tone of their service will be improved, the prospective subscriber and existing flat rate subscriber raise the cry of exorbitant rates. They build up quite a fortress of arguments; they refer to "large dividends," "watered" capital, "old system worked well and gave satisfaction," and "higher prices on measured rates," but this pile of arguments usually crumbles when you ask a man if he considers it fair that a small user should pay the same as a large user, or if a man sending six telegrams a day should pay as much as a man sending sixty telegrams a day.

In the discussion of the new rates we have not found that it helps us much to tell a man that the flat rate of a large user does not pay the Company. Our best arguments have been found to be—

"Improvement in service by the elimination of unnecessary messages."

"Extension of the service by getting larger numbers of small and moderately large users to join."

"The fairness of charging a subscriber in proportion to the service given."

To these are added whatever other arguments the local or individual circumstances of the case permit.

That the new rates are making headway and gaining ground there is not a shadow of doubt. If I were asked to prove it, I would, besides pointing to the steady increase in new business and the numerous subscribers taking private branch exchanges on measured rates, refer to the large number of subscribers changing from the old rates to the new. This item of superseding is steadily growing. During November, for instance, we had more than four times the amount of gain under that heading, as compared with same month last year, showing as clearly as can be, the popularity of the new rates.

GRANTS MADE BY THE COMPANY TO TELEPHONE SOCIETIES FOR SESSION 1907-8.

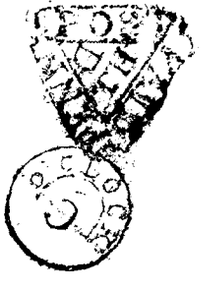
	£	s.	d.		£	s.	d.
Glasgow and West of Scotland	4	8	0	Liverpool and Birkenhead	5	0	0
Glasgow Operators	5	0	0	London	4	3	6
Bolton	5	0	0	Blackburn	5	0	0
Leeds	5	0	0	Coventry	4	12	0
Portsmouth	4	18	0	Bristol	5	0	0
Plymouth	4	4	0	Bristol Operators	5	0	0
Greenock	4	12	0	Swansea	5	0	0
Chester	4	5	0	Swansea Operators	5	0	0
Douglas	4	19	0	Nottingham	5	0	0
Manchester	3	15	6	Nottingham Factory	5	0	0
Wolverhampton	5	0	0	Hull	4	15	6
Birmingham	4	7	6	Dublin	3	8	0
Birmingham Operators	5	0	0	Leicester	4	12	0
Sheffield	4	9	0	Cardiff	4	7	6
Newcastle	5	0	0	Cardiff Operators	4	15	6
Bradford	4	10	6	Oldham	1	12	10

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from page 63.)

In 1680 the first local penny posts were suggested by Robert Murray and established by William Dockwra, and his handstamp is really the first postage stamp known (Wright and Creeke, p. 13). By the by, the illustration is incorrect, as pointed out by Hendy. I show a photograph of his pamphlet regarding his undertaking. He had the following receiving offices:—The General in Star Court, Cornhill, Lyme Street, St. Paul's, Temple, Westminster, Southwark, and the Hermitage. I show his type of triangular paid stamp.



In a volume of State Poems, written in 1697, I have an ode on the late Invention of the Penny Post, by Mr. Dockwra. My copy has the bookplate of Edward Duke of Norfolk, Earl Marshal of England.

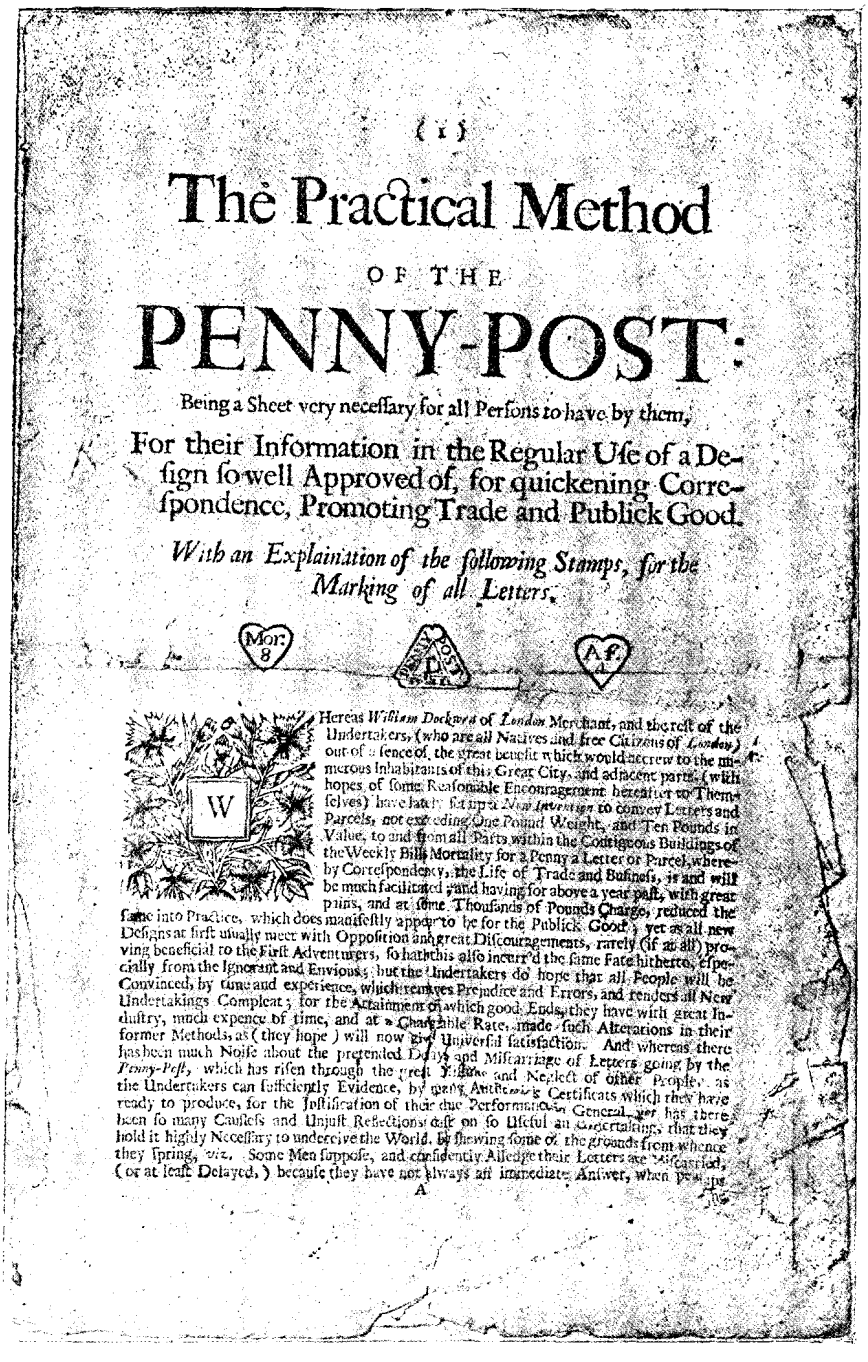
Dockwra's undertaking was taken over by the Post Office, and for the first time the City Post, which did not exist before Dockwra's, was under Government control; thus commenced what was known until 1854 as the London District Office as a separate establishment.

At the succession of William and Mary, Dockwra was appointed Controller of the District Post.

I have just noticed that in the Postmaster-General's first report the date of Dockwra's Post is incorrectly given.

The revenues of the Post Office were partially applied to pension, and the Duke of Leeds was in 1694 in receipt of £3,500 "for negotiating our Royal Marriage." Curiously enough the Duke informed against the notorious Titus Oates, who was after his sentence for perjury given a pension by the following :—

"We [William the Third] for divers good causes and consideracons Us hereunto moveing . . . Have given and granted by these presents . . . unto Titus Oates Doctor in Divinity his Executors Administrators and Assignes



(1)

The Practical Method

OF THE

PENNY-POST:

Being a Sheet very neceſſary for all Perſons to have by them,

For their Information in the Regular Uſe of a Deſign ſo well Approved of, for quickening Correſpondence, Promoting Trade and Publick Good.

With an Explaination of the following Stamps, for the Marking of all Letters.

Mor: 8

A. f.

WHereas *William Dockwra* of *London* Merchant, and the reſt of the Undertakers, (who are all Natives and free Citizens of *London*) out of a fence of the great benefit which would accrew to the numerous Inhabitants of this Great City, and adjacent parts, (with hopes of ſome Reaſonable Encouragement hereafter to Themſelves) have lately ſet up a *New Invention* to convey Letters and Parcels, not exceeding One Pound Weight, and Ten Pounds in Value, to and from all Parts within the Contigious Buildings of the Weekly Bills Mortality for a Penny a Letter or Parcel, whereby Correſpondency, the Life of Trade and Buſineſs, is and will be much facilitated and having for above a year paſt, with great pains, and at ſome Thouſands of Pounds Charge, reduced the ſame into Practice, which does manifeſtly appear to be for the Publick Good; yet as all new Deſigns at firſt uſually meet with Oppoſition and great Diſcouragements, rarely (if at all) proving beneficial to the Firſt Adventurers, ſo hath this alſo incurr'd the ſame Fate hitherto, eſpecially from the Ignorant and Envious; but the Undertakers do hope that all People will be Convinced, by time and experience, which removes Prejudice and Errors, and renders all New Undertakings Compleat; for the Attainment of which good Ends they have with great Induſtry, much expence of time, and at a Chargable Rate, made ſuch Alterations in their former Methods, as (they hope) will now give Univerſal ſatisfaction. And whereas there has been much Noiſe about the pretended Delays and Miſcarriage of Letters going by the *Penny-Poſt*, which has riſen through the great Villanie and Neglect of other People, as the Undertakers can ſufficiently Evidence, by many Authentick Certificats which they have ready to produce, for the Juſtification of their due Performance: So General, yet has there been ſo many Cauſleſs and Unjuſt Reflections caſt on ſo Uſeful an Undertaking, that they hold it highly Neceſſary to undeceive the World, by ſhewing ſome of the grounds from whence they ſpring, viz. Some Men ſuppoſe, and confidently Alledge their Letters are Miſcarried, (or at leaſt Delayed,) becauſe they have not always an immediate Anſwer, when perhaps

A

one Annuity or yearly pencon of Three hundred pounds of lawful English money . . . payable out of Our Revenues . . . of the General Letter Office or Post Office . . . for the term of ninety-nine years . . . if he the said Titus Oates and Rebecah his wife or either of them shall soe long live."

In 1696, Sir Thomas Frankland, a Yorkshire baronet of good estate and M.P. for Thirsk, was a Postmaster-General, and established many Cross Posts to go direct to places off the mail routes.

In 1715, Frankland was succeeded at the Post Office by Lord Cornwallis and James Craggs, who began life as a barber, and was subsequently a footman to the Duchess of Cleveland. He had a most prosperous career until involved in the South Sea Bubble, but committed suicide in 1718.

In 1719, Ralph Allen, assisted by Edward Carteret, one of the Poster's General, did much to improve the dispatch of correspondence by running posts direct between various towns, and an agreement was signed 12 April, 1720, under which he paid £6,000 per annum for the farm of new Cross Posts. Fielding's picture of Allen as Allworthy is said to be a very just estimate of the man.

Of Allen, Pope wrote—

"Let Humble Allen, with an awkward shame
Do good by steath, and blush to find it fame."

The following letters and accounts were written by Ralph Allen in 1761, when seeking a renewal of his contract for the seventh time :—

"Prior Park, Dec. 2nd, 1761.

"Sir,—I have now, pursuant to the clause in my contract, sent the Postmasters General under your cover a full and clear state of my accounts for the management of the Bye and Cross Road letters in the year ending with last Midsummer, which is more beneficial to me than any of the preceding years, and much more than can be expected from any of the succeeding during the remainder of my contract, for the reasons particularly inserted at the bottom of that state.

"With this account I have sent a plain narrative of all my transactions with the Government from the commencement of my concerns to this time, for the better enabling the Lords of the Treasury to form an equitable judgment on my case.

"These papers, with my respectful compliments, I desire you will present to the Postmasters General, to lay before the Treasury when and in what manner they may think fit.

"With these papers are two other copies of the narrative: one of them is for Lord Bessborough and the other for Mr. Hampden.

"I desire you will acknowledge your receipt of this letter and the enclosed papers to "Sir,

"Your most h'ble Servant,

"To Henry Potts, Esq. ——— R. ALLEN."

"I.—An abstract of the State of Mr. Allen's account for the Bye and Cross Road letters in the year ending with Midsummer, 1761.

	£	s.	d.	£	s.	d.
The gross amount (*i.e.*, of postage)				31,299	4	3
Salaries, dead letters, and allowances to the Country Deputies ..	8,481	17	1¼			
Other expenses over and above the salaries and allowances to the Country Deputies	4,569	0	0			
The annual rent to the Government	6,000	0	0			
				19,050	17	1¼
The Nett Produce..				£12,248	7	1¾

"Upon this occasion it is proper to observe that the next year's clear produce will be considerably reduced by additional salaries to the country deputies, in consequence of Mr Allen meeting of the every day post at his own charge, which cost him at least £3,000 per annum, a small part of which sum only can be expected to be repaid to him by the increase of the Bye and Cross Road letters.

"Another great lessening of the nett profits of this concern in the following years must be expected upon a peace, which will evidently appear from the following observation, viz., in the year 1755, before the commencement of this war, the gross produce of the postage of the Bye and Cross Road Letters was no more than £25,142 per annum, but since that year, from a successful war and vast increase of commerce under the protection of it, this article has increased to such a degree that by the above State of Mr. Allen's accounts for the year ending with last Midsummer they amounted to £31,299, which is an augmentation of £6,157 per annum.

"A third cause for the increase of the postage of this year's letters is the interval of Franking, though a short one, at the general election.

"To finish this representation it will be necessary to take notice that the Bye and Cross Road Letters in 1710, before the commencement of Mr. Allen's concerns with the Government, produced no more than £3,700 per annum, but in the year ending at Midsummer, 1761, they are increased to £18,248 after the expenses for the management of Mr. Allen's plan are deducted, which shows a clear increase of £14,548 in this article.

"The annual amount of the country letters in 1719 was, upon a strict examination made by the Accomptant of the Post Office, found to be £15,433, which letters at Midsummer, 1761, amounted to £27,898, which creates an annual increase in this article of £12,465 a year. To this memorandum it must be added, when Mr. Allen entered upon his regulations both the above branches of the revenue were considerably sinking, and under the bad management that they were then in must in a few years have been reduced to a trifle.

"Likewise, that several of the officers in the above list of expenses for the management of Mr. Allen's concerns are very serviceable to the general revenue of the Post Office, and must have been supported at the expense of the Government if they had not been annually paid by him.

"To the several articles of increase above mentioned it will be proper to add the great increase of the London letters, in consequence of Mr. Allen erecting the every day Posts between that City and the most considerable places of commerce throughout the kingdom at his own expense.

"This account, thus explained, shows the true state of Mr. Allen's affairs at this time.

"Dec. 2nd 1761. ——— R. ALLEN."

"II.—A particular account of expenses for the management of the Bye and

Cross Road letters over and above salaries given to the Country Deputy Postmasters in the year ending with Midsummer, 1761.

	£	s.	d.
Three Surveyors at £300 per annum	900	0	0
An additional allowance to Mr. Atkinson Robinson, Surveyor, in consideration of his long, able, and faithful performance of his duty in that station	100	0	0
To Mr. Potts, the Secretary, and his Clerks	300	0	0
To Mr. Hall, the Solicitor	100	0	0
To Mr. Christopher Robinson	150	0	0
To the Comptroller	100	0	0
To Mr. Pitchers	60	0	0
To Mr. Strictland	15	0	0
To the Inspector of the Franked Letters	20	0	0
To Mr. Jackson	50	0	0
Allowances to the following Deputy Postmasters (with) whom no particular accounts are opened :—			
Woobun	4	0	0
Hertford	5	0	0
Dunstable	40	0	0
St. Albans	6	0	0
Barnet	6	0	0
Snow Hill	30	0	0
Oxford	15	0	0
Rochdale	15	0	0
Ongar	7	0	0
Lewestoffe	6	0	0
Tuxford	5	0	0
Woodstock	5	0	0
Kettering	3	0	0
	174	0	0
	1,969	0	0
To four clerks, viz. :—			
Mr. Prynn, senr.	200	0	0
Mr. Prynn, junr.	150	0	0
Mr. William Ward	150	0	0
Mr. Thomas Hyett	100	0	0
	600	0	0
Expenses attending my last journey to London in the renewal of my contract, in fees and all other charges	500	0	0
The offices at Prior Park, bags, mails, bills, vouchers, fire, extraordinary journies, and other incidents attending the management of this concern, at least	600	0	0
To my nephew, Philip Allen, as the person principally employed in the management of this enlarged concern, £600, and for servants and horses attending it as a Surveyor, £300, in all	900	0	0
	£4,569	0	0

"The great increase of business in my management of this branch of the Post Office revenue necessitated me, some years since, to have a principal assistant, for the better conducting this enlarged concern during the remainder of my life, and to leave it under the best regulation at my death, and finding my nephew, Philip Allen, qualified for this office I preferred him to any other as one in whose care and diligence I could most confide, and as a relation whom it was natural for me to desire to benefit, but my principle motive for this choice was its enabling me to fulfil in the most perfect manner my obligation to the public.

"By my contract I have bound myself to leave at my death the best and fullest directions I am capable of imparting to the Postmaster Generals for their right management of this branch of the revenue; but verbal instructions, directions or explanations in writing, how full soever and how careful soever drawn up (as those I shall leave to the public will be), have their obscurities even in essential points, and need explanation by one that has been well versed in the management of these concerns, but it is not to be supposed that during my management I should impart all these things to any but a relation in whom I have a perfect reliance.

"Dec. 2nd, 1761. R. ALLEN."

These illustrate the condition and management of the Posts by Allen.

When Allen died in 1764 Mr. Ward took charge of the Cross Posts, or, as they were now called, the Bye Letter Posts, which in 1799 were abolished, and the management transferred to the General Post Office.

I have an interesting autograph letter of Edward Carteret, the contemporary Postmaster-General 1721-39.

In connection with the British Post Offices abroad, I should have mentioned a distinguished name, Benjamin Franklin, who was Postmaster of Philadelphia in 1737, and joint Postmaster-General of America 1753 to 1774, conjointly with Col. William Hunter, the salary to be £600 per annum between them, if they could provide that amount from the nett proceeds of their office. The receipts up to this time had never been sufficient even to pay a shilling of Revenue to the English Treasury.

In the summer of 1753 Franklin made a tour of inspection and introduced some system and life into the Department, and in 1757 was able to state the yield was three times as much profit to the Crown as that of the Post Office in Ireland.

In 1774 Franklin was dismissed; his connection with the events preceding the Revolution may probably explain the reason.

In 1776 Congress unanimously elected him Postmaster-General of the States with a larger salary and greater power. He was appointed Commissioner to France, 26th Sept., 1776, and left his son-in-law, Richard Bache, to act as Postmaster-General.

In March, 1777, Franklin was Minister to Spain.

From 1798 to 1836 a notable man, Sir Francis Freeling, was Secretary of the Post Office. He was distinguished in Art and Literature. Tom Hood dedicated the 1st volume of his Comic Annual to him in the following amusing way :—

To Sir Francis Freeling, Bart.,
The Great Patron of Letters,
Foreign, General and Twopenny
distinguished alike for his fostering care of the
Bell letters
and his Antiquarian care of the
Dead Letters,
whose increasing efforts to forward the speed of intelligence as Corresponding member of all Societies (and no man fills his post better) has singly, doubly and trebly endeared him to every class.
This first volume of the
Comic Annual
is with Frank permission dedicated by
Thos. Hood.

There were sundry officers in the Inland Office (in 1763) called "Facers of Letters," and at that same there was also an "Alphabet Keeper," who had £40 per annum for instructing young officers, but not, it is to be presumed, for teaching them their alphabet. Then there was Thomas Hornsby, watchman, who had £20 per annum as watchman and £80 per annum for lighting fourteen lamps, which must surely have been very difficult to light, as a man might well undertake even to light fourteen lamps and find the material into the bargain for £80 per annum.

Also the sum of £6 7s. was paid to a man for hoisting the colours, from March, 1761, to June, 1764. There were also sundry allowances for drink money and feast money to the clerks, amounting in all to £100 per annum; for it was a part of the creed of our forefathers that the same menstruum which was employed to rouse the faculties of the Laureate might advantageously stimulate the energies of a "Facer of Letters" and a "Keeper of the Alphabet." Then Mr. Henry Porter had £50 per annum for taking care of the candles, but I must observe that they were wax candles and cost nearly £900 per annum, so that they deserved some care.

A small revenue (about £1,000 per annum) was derived from the carrying of expresses. Thus, for an express from London to Newcastle the Post Office got £3 3s., but it is to be supposed this was not the whole cost of the express, but only the portion accruing to the Crown.

The packets in those times, when war raged for so many years and when every sea was covered with French privateers, gave our Postmaster-General very great and constant anxiety.

Their orders to the captains of such vessels are urgent, that they shall run while they can, fight when they can no longer run, and throw the mails overboard when fighting will no longer avail. In 1693 we find frequent rescripts from Queen Mary, the King being absent, ordering her Master Gunner "to provide the Diligence packet, of 85 tuns and 14 guns (or some other powerful man-of-war), with powder, shot, and fire-arms, and all other munitions of war." Then comes a piteous petition from James Vickers, captain of the *Grace Dogger*, who, as he lay in Dublin Bay waiting until the tide would take him over the bar, was seized by a French privateer, the captain of which stripped the *Grace Dogger* of her rigging, sails, spars, and yards, and of all the furniture "wherewith she had been provided for the due accommodation of passengers, leaving not so much as a spoone or a naile hooke to hang anything on," and finally ransomed her to the aforesaid James Vickers for fifty guineas, which sum, with the cost of the other losses, our Postmaster-General had to pay.

Then comes the petition of Anne Pageall, widow of John Pageall, captain of the *Barbabella*, showing that the said John had been carried prisoner into Dunkirk, and had there suffered grievous sickness for six months, whereof at length he dies, and this petition also meets with favourable consideration.

Hereupon our Postmasters-General resolve to build swift packet-boats that shall escape the enemy; but build them so low in the water that shortly afterwards "wee doe find that in blowing weather they take in soe much water that the men are constantly wet all through, and can noe ways goe below to change themselves, being obliged to keep the hatches shut to save the vessels from sinking, which is such a discouragement of the sailors that it will be of the greatest difficulty to get any to endure such hardships in the winter weather."

It is clear, therefore, to our Postmasters-General that "boats of force to withstand the enemy" must be built, and "boats of force" they set themselves to equip. They feel justified then in raising the freight of passengers from Harwich to Holland from 12s. and 6s. for the first and second-class passengers to 20s. and 10s.; but they judge that "recruits and indigent persons shall still have their passage free." We get occasional glimpses of these indigent passengers by the Harwich and Falmouth boats, and find "Francisco Martino" and "Francisco Evangelista," who have suffered "for their king, and have not wherewithal to pay their charges," availing themselves of the bounty which England has always extended to political refugees.

(To be continued.)

WHAT THE COMPANY IS DOING.

THE following exchanges have been opened during last month:—Wrington, Yatton and Frenchay (Bristol district), Yealmpton (Plymouth), Upton-on-Severn (North Midland), Fettercairn (Dundee), Burton Latimer (South Midland), Alvaston (Nottingham), Burghfield (Reading), Fort William (Belfast), Southfleet (Maidstone), Silverdale (Hanley), Cullompton (Exeter), Alresford (Southampton), and Darvel (Ayrshire), making a total of 1,497 in all; 2,930 new stations were added during May bringing the total to 460,558.

NEW WORK, EXTENSIONS, ETC.

Bournemouth.—The extension of the central switchboard capacity to 2,100 lines, together with the installation of power plant, consisting of Nodon valve rectifier and seven-plate chloride accumulators, has now been completed. A party line transfer section for 30 lines has also been brought into use. Premises have been secured, and the underground work commenced for fitting up an exchange in the rapidly growing residential suburb of Southbourne. The extension of the underground system which carries the underground work as far as the Parkstone Exchange has also been carried out, and the pipes laid for a system of underground cables in the town of Poole. An extension of the underground work to the Alum Chine district of Bournemouth has also been authorised and will be commenced immediately.

Belfast.—A scheme of decentralisation has been adopted within the Belfast Exchange area, and estimates have been approved for the opening of three sub-exchanges, *i.e.*, Fortwilliam, Knock and Malone. The former exchange, which is equipped with one junction position and three subscribers' sections of 100 lines each, with an ultimate capacity of 500 subscribers' circuits, was opened for traffic during the month of June. The test-room equipment comprises one 1,000 line test frame, fitted for carbon arresters and heat strips, and the necessary accommodation is also provided for batteries, etc. The Fortwilliam Sub-Exchange premises are situated some two and a half miles from the Belfast Exchange, and in the completion of the transfer of subscribers' circuits and the provision for future development within the sub-exchange area it has been found necessary to deal with 2 miles 1,741 yards of additional underground cables.

Cambridge.—A new building is being erected in Alexandra Street, Cambridge, to accommodate the new central battery exchange which is to be equipped there. A new underground scheme is being carried out and the duct laying is complete.

Great Yarmouth.—Duct laying is complete in connection with a new underground scheme which is being centralised on the Company's new premises at Howard Street, North, where a new common battery exchange is to be installed.

Nottingham.—The completion of various outstanding underground schemes has increased the Company's mileage here by 4,500 miles since Jan. 1 last.

Thames Valley.—The Company has taken premises at Crowthorne and Farnham Common for establishment of new exchanges at these places, and stores are now being delivered.

Enfield.—The conversion of plant from overhead to underground has been carried out in connection with the transfer to the new common battery exchange.

Tottenham—The new common battery exchange was opened on May 18, and in connection therewith all aerial plant was diverted into an extensive underground system, comprising 6¾ miles of trench and various sizes of cables.

PRIVATE BRANCH EXCHANGE WORK.

In *London* the British Electric Traction Company have signed a contract for six junctions and 88 stations. At *Reading*, Messrs. Heelas, Sons & Company, Limited, are taking two junctions and twelve stations. Messrs. Cooper & Company, *Glasgow*, have increased their junction lines from eight to twelve, having already 48 extensions. Messrs. J. & W. Campbell & Company have taken a private branch exchange with seven junctions and 37 stations, and the Co-operative Society, Clydebank, one with two junctions and 64 extensions. At *Brighton*, Warnes Hotel has arranged for a system of two junctions and twenty extensions.

CORRESPONDENCE.

TELEPHONE EXPRESSION *VIA* IMPRESSION.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

OUR service has been well discussed from an "operator's point of view," therefore I should like to express as a former subscriber something of *their vision or experience*. The first impression a new subscriber receives over the wires, due to rapid articulation (more especially in the north), is something like this—Operator: "Thunder, please." Subscriber: "Sorry can't catch it." "Mumble, please." "Oh!" *Our intention had been to shout*—etc., etc., according to the inflexion of the young voice. A confused idea follows, but we try again, only to hear we are "being put through." Where? Further invisible misapprehension! Looking at the automatic box *2d.*, we think of another "*Tube*" and distinctly hear "*something on the line.*"

Could there not be found in our extensive English vocabulary two words which might help the public more than "Number, please." I have listened to it many hundred times to-day and venture to suggest the word number should be the *last* spoken instead of the *first*, because more often *only* the *last word* (usually the *telling one*) is clearly heard by a subscriber. Where speed is a feature the first word inevitably gets rushed, mumbled or abbreviated, and, before all, the public prefer to get what they want. Courtesy will then be no stranger to either subscriber or operator.

One subscriber has just remarked "he will look up the dictionary," of course meaning *directory*, which suggests that different telephone expressions might well be clearly explained in the latter, or the definition of different terms printed on the card of instructions tacked beside the telephone, as a guide to the novice. For what does the word trunk convey until one knows the system? Also the public are most difficult to convince that *the line is engaged*. Let them understand *what is meant* by this expression and it would considerably help our service.

The following illustration may give point:—

Sporting tripper: "Number 11."
Junior operator: "The line is out of order."
Sporting tripper: "What d'ye say?"
Junior operator: "The line is out of order."
Sporting tripper: "What d'ye mean? I'm not off fishing; give me No. 11, and sharp."
Junior operator (nervously): "The people are out of order, sir."
Sporting tripper: "Oh! Oh!! Well tell them I '*called*' and hope they'll soon be '*O.K.*'"

Needless to add *the line* at present is "O.K." though the misunderstanding remains.

Scarborough, June 11. F. MAUDE DISTIN, Clerk-in-Charge.

"NUMBER, PLEASE."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

ON perusing an article entitled "Telephone Etiquette" in the May JOURNAL I noticed that in order to economise time it was suggested that the word "please" be used alone, the word "number" being understood.

Why not use the word "yes," as in the majority of cases the subscriber's enquiry is, "Are you there?" This word as an answer to the above query would be more comprehensible than "please" to the average subscriber. It is also easier to form, has greater acoustical properties than "please," and cannot be imparted in such a peremptory manner as "number," which was also dealt with in the aforementioned article.

"Yes" might also be understood as "Yes, I hear you," and even the most infrequent user would realise that it meant the operator was prepared to receive the number.

If the word fits in with the subscriber's thoughts at the psychological moment (which are, as a rule, "Is the operator there yet?"), then we are on the high road to efficient service.

Dundee, May 25. ALEXR. STEWART.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to the letters recently appearing in the JOURNAL under the above heading, I am in fear and trembling when I make bold to disagree with the note which the Editor inserted after the first letter on the subject by Mr. Owen, but I think the word "please" would be well left out of the operator's answer and feel sure the time is coming when it will be. The repetition of the word is a waste of time and but a relic of the days when a telephone exchange consisted of friends' lines for mutual benefit run on to a cumbersome arrangement for switching. But all that is changed, and a telephone exchange now is provided for public use as a *rapid means* of communication. To do such a service and its subscribers justice it is incumbent to minimise to the utmost extent the idea that there is such a thing as an exchange. When a subscriber makes a call, his wish is to get into communication with the person called at the earliest possible moment, and under such circumstances no courtesy is requisite or is demanded. Take the case of a telegram; the curtailed messages seldom, if ever, show the use of such words as "please," "Mr.," etc.

All conversation by telephone should certainly be carried on courteously, but the operator is the exception and is forbidden to converse with subscribers.

The value of telephone service lies in its rapidity. That which impedes its rapidity must therefore lower its value, and it is this alone which makes the word "please" superfluous.

A full-toned "NUMBER" would, to my ears, be more musical, and indeed courteous, than the three-second speed "NUMBEHLEE."

Mr. Wicker suggests that a mechanical means of conveying certain ideas to subscribers might be made use of. He might be interested to know that I recollect that in America, some time ago, they informed subscribers who called for engaged numbers the fact by a buzzing noise in the receiver.

Nottingham, May 21. T. JUSTIN, Chief Contract Clerk.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THIS subject seems likely to be discussed and ended without anyone providing a pleasant and practicable alternative. May I suggest one? "Whom, please," seems preferable for these reasons: It is two-thirds the length of the other; there is no syllable *er* to slur or omit (it often is omitted), for the closing of the lips on "whom" is only that necessary for the pronunciation of "please"; "whom" cannot by any possibility be mangled as is "number," and it might perhaps cause an operator here and there to wonder what is the correct grammar and English for the irritated and irritating "*Who* do you *want*?"

June 17. EDGAR J. FRASER.

RECORD BALANCING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

SINCE Mr. Crowther's letter, which appeared in your issue of October last, announcing that Mid-Yorkshire district had achieved a record as regards the balancing of stores and tools, I have eagerly scanned the columns of this JOURNAL during the months which have since elapsed, thinking that the date mentioned by him would have been further improved on by some other district. However, no one appears to have, up to the present, accomplished the task, and it therefore falls to my lot to append an achievement which will, no doubt, interest the clerical staff, and more particularly those whose daily work is somewhat similar to my own.

Without any assistance I was able to report on the evening of June 6 that I balanced my stores and tools correctly for the quarter ending May 28. During the three months referred to, the number of postings on the cards amounted to 3,082, while no fewer than 2,854 stores issue slips (B.95 and B.96) were entered in the blue and white books, priced and transferred to the outwards book, the *or* return despatched to Head Office and the No. 6 ready to be forwarded when its due date arrived.

Dublin, June 11. C. J. PURCELL, Stores Clerk.

NEWS OF THE STAFF.

Mr. A. E. COTTERELL, Assistant Superintendent for the Midland Province, has been transferred to the Southern Province in a similar capacity. Mr. Cotterell entered the service of the Midland Telephone Exchange in November, 1879. He became Manager for the Potteries district of the National Telephone Company in March, 1886; Manager for Birmingham in June of the same year; District Manager, Birmingham district, in 1893, and Assistant Superintendent for the Midlands on Jan. 1, 1900.

MR. F. W. TAYLOR.

Mr. JOHN SCOTT, District Manager, Manchester, has been appointed Assistant Midland Superintendent. Mr. Scott entered the service in November, 1895; became District Manager at Galashiels in February, 1896. He was transferred in a similar capacity to Blackburn on Aug. 1, 1900, to Leeds on Aug. 1, 1902, and to Manchester in July 1, 1905.

Mr. F. W. TAYLOR, District Manager, Brighton, has been appointed District Manager, Manchester. He entered the service in 1887, and was Engineer in London, No. 3 Division, when he was transferred as District Manager to Reading in 1894. He was appointed District Manager, Brighton, in July, 1904.

Mr. C. F. MOORHOUSE, Contract Manager, Brighton, has been appointed District Manager in that town. He entered the service in December, 1886. In January, 1895, he was Assistant Engineer in London, No. 2 Division. In July, 1898, he was appointed Local Manager, Paddington; in March, 1899, District Manager, Eastern London; in August, 1905, Contract Manager for London, and in October, 1906, Contract Manager at Brighton.

MR. C. F. MOORHOUSE.

Mr. A. GODDEN, Resident Inspector, Yeovil, has been promoted to be Chief Inspector, Winchester.

Mr. W. GILL, Inspector, Weymouth, has been promoted to be Resident Inspector, Yeovil.

Mr. N. T. COX, Inspector, Winchester, has been transferred to Southampton.

Mr. J. H. GWYER, Local Manager, Southampton, has been presented with a marble clock and a case of pipes to mark the completion of 25 years' service, including five and a half years as Local Manager at Southampton.

Mr. C. E. GILLMAN, Wayleave Officer, Ware, has been promoted to be Inspector-in-Charge at Uxbridge.

Mr. G. F. BECK, Storekeeper and Local Office Clerk, Watford, has been promoted to be Contract Clerk, Luton.

Mr. W. LAND, Assistant Engineer, Luton, has resigned to take up the management of the Bedfordshire Cleaning Company.

Miss DORA MACLAINE, Charing Cross Exchange, Glasgow, left the Company's service on May 14. Before leaving she was presented with a leather purse bag by the staff in her exchange.

Mr. D. WALLACE, Contract Officer, Birmingham, has been appointed to succeed Mr. Moorhouse as Contract Manager at Brighton.

Mr. R. D. MESTON, District Office, Edinburgh, was presented with a travelling rug and a pocket book on leaving the service to go to Canada.

Mr. HUGH MCLEAN, Junior Complaints Clerk at Edinburgh, has been transferred to Birmingham. He was presented with a very good dressing case.

Mr. F. J. SANDIFORD, on being promoted from the position of Second Inspector at Ramsgate to that of Chief Inspector at Margate, was presented with a silver cigarette case which was subscribed for by the Ramsgate staff.

Miss CATT, Operator at Broadstairs, was presented, on resigning the Company's service, with a gold brooch, the gift of her fellow operators.

Lineman-Inspector O. JONES, Nottingham, has resigned, and is taking up the charge of telephone plant in Lagos, West Africa, after twenty years' service with the Company spent in Birmingham, Derby and Mansfield.

Mr. W. H. JONES has been transferred from Truro to Plymouth as Local Office Clerk.

Mr. A. G. HOBBS, Contract Agent, Derby, has been transferred to Nottingham.

Miss S. WHITTAKER, Bolton, resigned the Company's service on June 11 and was presented by the switchroom staff with a gold locket as a token of their regard.

Miss M. FISHER, late Senior Operator, Manchester, has been promoted to be Clerk-in-Charge, Bolton. Miss Fisher who has been ten years in the service of the Company, was presented with a handsome gold locket and chain by the Manchester switchroom staff, with their best wishes for her future success.

Miss A. M. LEWIS, Observation Clerk, Swansea, who has been appointed Clerk-in-Charge at Exeter, was, prior to her leaving Swansea, presented with a gold pendant as a token of esteem.

Miss MABEL ORRELL, Senior Operator, Sheffield, has been promoted to be Supervisor.

Miss GERTRUDE FOULKES, of the Royal Exchange, Liverpool, resigned on May 8 owing to ill-health. She was presented with a gold bangle by the Liverpool operating staff on leaving.

London Traffic Department.—*Promotions and Transfers:*

Miss E. KNAPTON, Clerk-in-Charge, Kensington, to be Clerk-in-Charge, Paddington.

Miss F. M. NELLOR, Senior Supervisor-in-Charge, Hammersmith, to be Clerk-in-Charge, Kensington.

Miss K. PRING, Senior Supervisor, East, to be Clerk-in Charge, Sydenham.

Miss M. BLAKESLEY, Supervisor, London Wall, to be Senior Supervisor-in-Charge, Croydon.

Miss G. SPARKES, Supervisor, Avenue, to be Senior Supervisor, East.

Miss A. M. RUFF, Operator, Gerrard, to be Supervisor-in-Charge, Finchley.

Miss A. KELLY, Operator, Holborn, to be Supervisor-in-Charge, Palmers Green.

Miss E. BRIGGS, Supervisor, Operating School, to be Supervisor, Gerrard.

Miss C. BANKS, Operator, London Wall, to be Supervisor, Operating School.

Miss A. TILLER, Operator, Holborn, to be Supervisor, London Wall.

Miss L. BAILEY, Operator, Avenue, to be Supervisor, Westminster.

Miss G. SHERBURN, Operator, London Wall, to be Supervisor, Avenue.

Miss L. BEVERLEY, Operator, London Wall, to be Supervisor, Holborn.

Miss J. M. KINSEY, Operator, Gerrard, to be Supervisor, Hop.

Miss L. HEALES, Operator, Holborn, to be Supervisor, London Wall.

On the transfer of Mr. H. F. CHURCH from the Traffic to the Maintenance Department, he was presented with a leather writing case by the Westminster operating staff.

We regret to note that Miss A. REEKIE, Clerk-in-Charge at the Bank Exchange, has recently had to undergo an operation for appendicitis at the London Hospital.

Mr. ROGER PAYNE, of the Metropolitan Cashiers' Department, who recently passed the first aid examination of the St. John's Ambulance Association, has now succeeded in passing their examination in nursing and hygiene.

It is with regret that we have to report that Mr. R. A. DALZELL, Superintendent of the Western Province, has been seriously ill with an attack of pneumonia. From the latest accounts it is hoped that he is now on the high road to recovery.

Mr. ERIC G. SHEPHERD, Assistant Engineer, Liverpool, is suffering seriously from appendicitis.

MARRIAGES.

Mr. WILFRED WILSON, Chief Inspector, Darlington, was married on June 8, on which occasion he was presented with a copper curb fender and fireirons, and a silver cruet set, by the members of the Darlington and Bishop Auckland staffs.

Mr. J. C. WITHERBY, of the Engineer-in-Chief's staff was married on June 6. On the day previous, Mr. Gill, on behalf of the staff, presented him with a Globe-Wernicke combined bureau and bookcase. In making the presentation, Mr. Gill spoke of Mr. Witherby's long term of service—seventeen years—with the Company.

Mr. J. MILNER SHACKLETON, of the Engineer-in-Chief's staff, was married on June 3 to Miss Agnes Mitford Abraham, at Trinity Presbyterian Church, Claughton, Cheshire.

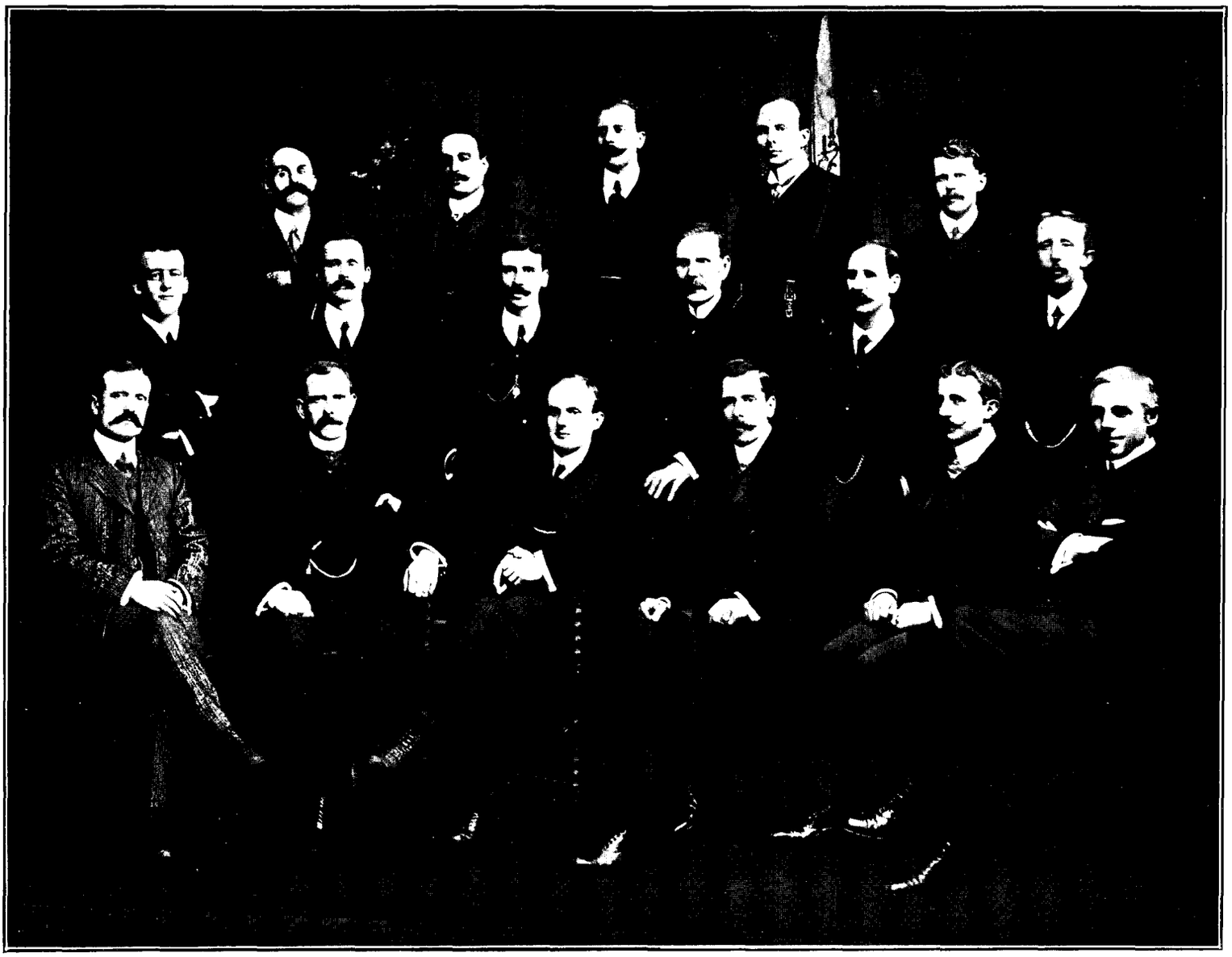
Miss PRESCOTT, Supervisor at the Central Exchange, Liverpool, left the Company's service May 14 to be married. She was presented by the operating staff with a standard lamp, and received several other presents from her colleagues.

Miss F. EDWARDS, Exchange Manager's Clerk, Liverpool, left the Company's service June 6 to be married. She was presented with a silver egg stand by the operating staff.

Miss POOLE, Senior Operator, Liverpool, resigned on June 18 to be married. She was presented by the operating staff with a dinner service.

Miss BLANCHE HARTNOLL, Senior Operator at the Royal Exchange, Liverpool, resigned on May 21 to be married. She was presented by the staff with a silver-mounted oak salad bowl, and in addition had numerous presents from individual members of the operating staff.

Mr. P. W. FOLLETT, of the Rentals Department, Salisbury House, London, was married on April 25. His colleagues presented him with a handsome



CONTRACT MANAGERS.

THE above photograph shows the Contract Managers who were present at the Officers' Meeting in London in May, with the exception of Mr. ALBANY, of Portsmouth. The names, reading from left to right, are—

Back row: Messrs. G. HEY (Oldham), F. W. GEORGE (Southampton), C. F. MOORHOUSE (late Brighton), F. H. TYAS (Leicester), and W. HAIMES (Nottingham).

Second row: Messrs. E. S. COOPER (Bristol), J. L. MAGRATH (Edinburgh), A. K. MURRAY (Hull), J. R. BROWN (Glasgow), O. G. LEE (Liverpool), and T. W. JOWETT (Bradford).

Front row: Messrs. H. ELLIOTT (Manchester), J. WRIGLEY (Sheffield), W. F. TAYLOR (London), W. R. SENIOR (Leeds), J. D. DUNCAN (Cardiff), and H. J. MACLURE (Birmingham).

marble clock and a pair of vases to commemorate the event, Mr. Bryson (Chief Clerk) making the presentation.

Miss M. H. AITKEN, Senior Operator, Edinburgh Central, who resigned to be married, was presented by her fellow operators and friends in the staff with a set of cutlery.

Mr. AIREY, Cashier, Blackburn, was presented with a cake stand by the district office staff and with a barometer by the Contract Department on the occasion of his marriage on May 28.

Miss WOODS, Senior Operator, Blackburn, who resigned to get married, was presented by the Blackburn operating staff with a plant stand.

Miss B. M. A. HEYWOOD, Bolton, who recently resigned to be married, was presented with an ornamental fire screen and copper coal scuttle by the switchroom staff, together with their best wishes for her future happiness.

On Miss E. STEPHENS, Supervisor, Westminster, resigning to be married she was presented by her colleagues with a silver-plated cruet.

Mr. D. C. WILSON, Test Clerk, Swansea, was presented with a handsome marble timepiece on the occasion of his recent marriage, the presentation being made on behalf of the staff by Mr. R. Williamson, Local Manager.

Miss MARGARET TURNER, Senior Operator, Tron Exchange, Glasgow, left on June 4 to be married. The staff presented her with a dinner set and rose bowl, which they asked her to accept with their best wishes.

Chief Fitter M. B. OLDBURY was married at Wolverhampton on Monday, June 1. The Nottingham staff presented him with a tea service with oak tray as a memento of the occasion. The District Manager, Mr. Sibley, made the presentation.

Miss M. DANCE, Operator, Wolverhampton, resigned on May 29, after ten years' service, to be married. Prior to leaving she was presented by members of the operating and office staffs with a handsome marble timepiece.

OBITUARY.

Mr. EVAN HUNTER.—It is with great regret that we announce the death on May 6 of this old servant of the Company. His illness was not of a protracted nature, as he was on duty as late as April 30, but a sharp attack of influenza developed into pneumonia, and he passed away as stated above. He joined the service in June, 1893, and was a Clerk in the Bookkeeping Department, Liverpool, where he remained up to the time of his death. The clerical staff was well represented at his funeral, and the floral token subscribed for was very beautiful.

Another member of the Liverpool staff died on Sunday, June 7, Mr. THOMAS MURPHY, Jointer, succumbing to a long illness following several operations which he had to undergo as the result of a slight accident sustained while at work in July last. His comrades and fellow-workers rallied round him well during his illness, and also subscribed for his stay in a convalescent home, but the strain on his health after the repeated operations he had to undergo proved too much for him. His funeral took place on June 14, at which a large number of his friends and fellow-workmen attended.

Mr. H. WRIGHT, Foreman, Sevenoaks, died on May 27. He first entered the service about fifteen years ago, but left it in 1901 to join the Tunbridge Wells Corporation telephone staff, and re-entered the Company's service in 1902, when the Tunbridge Wells Corporation telephones were taken over. He has been ailing for the past two years, and, after a long illness, died from aneurism of the heart, at 44 years of age. He was greatly respected by his workmates and the staff in general, several of whom attended his funeral.

LOCAL TELEPHONE SOCIETIES.

Brighton.—The final meeting of the session was held on May 27, when Mr. W. Goulden gave a lecture on the "No. 9 Common Battery Switchboard Equipment." The lecturer explained the system in a very lucid manner, and with the aid of diagrams showed in detail the subscribers' apparatus, outgoing and incoming junctions and other connections. At the termination of the lecture Mr. Goulden, who has recently received an appointment in the Engineer-in-Chief's Switchboard Construction Department, was presented with a handsome kit-bag. Mr. F. W. Taylor, District Manager, who made the presentation on behalf of the staff, thanked Mr. Goulden for the great assistance he had always rendered to the society and for the good work he had done in Brighton, and also congratulated him on his promotion. Mr. Goulden responding thanked his friends and colleagues for the handsome present, and expressed his regret at leaving Brighton.

Southern (London).—At the last meeting of the present session, held on May 19, a paper illustrated by lantern was given by Mr. W. Blight, vice-president of the society, on "The Supply of Power to Small Exchanges." The subject was dealt with under two headings, namely, (*a*) by charging accumulators in series with the ringing motors, and (*b*) by charging accumulators over junctions from other exchanges. The method of calculating the maximum and average discharges for such exchanges was explained in full detail, and a scheme was submitted providing for the whole of the exchanges in the Southern district.

Dover.—The concluding meeting for 1907-8 session was held in the district offices, Dover, on June 1, when papers were contributed by Mr. H. G. Smith, Chief Inspector, Dover, on "Inspecting," and by Mr. J. Allen, Foreman, Folkestone, on "Trenching, Pipe and Block Laying." Only fourteen members were present, or 31 per cent. of the total members of the society. Keen interest was, however, taken in the reading of the papers, which were freely discussed.

Liverpool and Birkenhead.—The final meeting of the session was held on April 30, the president being in the chair and 120 members and two visitors present. Thirteen ten-minute papers were submitted by members of the staff dealing with various subjects, three prizes having been offered for the three best papers. Below is given a complete list of the papers, together with the result of the voting: "Cable Heads," Mr. Kneale; "Cotton Exchange Telephone Installation," Mr. Crowley (second prize); "Liverpool Service or Fault Department," Mr. Roberts; "Fault Department," Mr. Johnson; "Hub of a Modern Telephone Exchange," Mr. E. Dougan; "Provision of Junctions between Exchanges," Mr. Edwards; "Description of Liverpool Police Signal Box System," Mr. Buckles (third prize); "Hints to Operators," Miss Jones, Royal Exchange; "Operating: Early Morning Duties," Miss Terrell, Royal Exchange; "Wood Poles for Overhead Work," Inspector Robinson (in his absence read by Mr. Goodman); "Storekeeping," Mr. E. Spargo, Birkenhead; "The History of the Transmitter," Mr. Schnyder; "Testing," Mr. Hincks (first prize).

STAFF GATHERINGS AND SPORTS.

Sheffield.—A cricket match had been arranged with Leeds Cricket Club to be played at Sheffield on Saturday, June 13. A party of nineteen came over, but owing to the wet weather the match had to be abandoned. The Sheffield staff entertained the Leeds staff to tea at the Mikado Café.

Burnley.—An outing promoted by the local staff was held on May 30, about 30 members and friends making the journey to Bolton Abbey.

Bournemouth.—A cycling club has been formed by those members of the staff possessing bicycles, and the first run took place on the evening of May 28, a distance of 25 miles being covered. The operating staff have purchased a tent for use on the beach for swimming, etc.

Ashton-under-Lyne.—A most enjoyable outing to Buxton, arranged by the Ashton staff, took place on Saturday, June 6, 1908. Members of the Oldham and Stockport staffs joined those from Ashton at Stockport station, where a specially engaged saloon was in waiting to convey the whole party on to Buxton. Upon arrival there the Buxton staff conducted the party for a ramble over the well-known Corber Hill, afterwards adjourning to the White Lion Hotel. While the tables were being cleared a photograph of the staffs was taken, and then a social evening was held at which all the party were present. The rest of the evening was devoted to visiting the various places of interest in the locality. The return journey was commenced at 9.25 p.m.

Glasgow.—The operating staff of the Douglas Exchange arranged for an evening cruise on the Firth of Clyde on Tuesday, June 2. Accompanied by many friends, they left the city at 6.20 p.m. for Greenock, where they joined the turbine steamer *Queen Alexandra*. After a delightful trip the city was reached again at 10.30 p.m. The committee are to be congratulated on the success of the outing.

Nottingham.—A cricket match between teams representing the Nottingham District and the Nottingham Factory was played on the Nottingham Forest on May 30. After a most enjoyable game the District Office won by 53 runs; the Factory making 41 and the District Office 94. The feature of the match was the remarkable bowling of Faultsman J. Hollis, who took seven wickets for four runs.

Croydon.—On Saturday, March 28, a most successful dinner was given to Mr. F. S. MacMillan, Local Engineer, Sydenham, at the "Fox and Hounds," Sydenham, upon his transfer to the Western district. Mr. Ridge was in the chair and many engineers were present, with practically the whole of the Sydenham staff. The chairman, in an appropriate speech, handed Mr. MacMillan a gold watch chain, subscribed for by the local staff. A capital concert followed at which Mr. W. R. Penson rendered some very effective items, the arrangements for the whole evening being made by Mr. Mantz, of the local staff.

Norwich.—*On May 20, at the request of members of the National Telephone* Association, arrangements were made at the Criterion Restaurant, Norwich, for the reading and discussion of papers dealing with political matters. Under the chairmanship of Mr. G. Platten, a very pleasant and instructive meeting resulted. The following papers were read:—"Tariff Reform," Mr. J. J. Manning; "Old Age Pensions," Mr. V. J. Holloway and Mr. W. J. Pratt; "The Licensing Bill," Mr. H. J. Herink. Messrs. H. M. Cowles, H. C. Clover and J. W. Fairhead joined in the discussion.

The lady members of the National Telephone Association (comprising the whole of the operating staff) had their third annual outing on June 18. They drove by waggonette to Coltishall, where boating, supper and a musical programme were indulged in. The return journey to Norwich was made by road *via* Wroxham, and a most enjoyable time was spent.

York.—The members and friends of the York staff, numbering about 22, had a very enjoyable trip to Scarborough on May 30. It is hoped that in future this will be an annual event.

Chatham.—A meeting was held at the local office on June 12 for the purpose of forming a cricket club. The Local Manager, Mr. J. C. Nichols, presided, and the venture promises to be successful. It is hoped that inter-centre matches may be arranged, and the remaining dates filled up by local teams.

Glasgow.—The annual picnic took place on the Victoria Day holiday, May 21. A large company went by special train to Rumbling Bridge, Perthshire, where under favourable weather conditions a most enjoyable day was spent. Dinner and tea were served at the Rumbling Bridge Hotel.

Edinburgh.—*Ampère Golf Club.*—The competition for the Stewart medal took place on May 23 over the Gorebridge course. Mr. Stewart was prevented from being present but a good turn-out of the club made the match enjoyable. Mr. R. Wilson (Chief Clerk) won the medal, Mr. Alt. Robson (electrical staff) and Mr. R. Bonnyman (district office) won the second and third prizes respectively, while Mr. R. Allan (electrical staff), who was fourth, carried off the special prize for the best scratch score. Before the game Mr. A. McNab photographed the players.

FREEMASONRY.

At the Lodge Meeting held on 16th May the following were initiated:—Messrs. J. R. B. Gall, M. B. Stephens, Jas. Prescott, John King and Jas. Hudson.

The number of applications for admission to the Telephone Lodge has been so great that it was found necessary to call an emergency meeting at the Gaiety Restaurant on 27th June for the purpose of initiating the following:—Messrs. Wm. Aitken, V. Baldwin, Chas. Edwards, C. W. Salmon and D. Stuart.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY. (LONDON.)

THE following grants have been made:—

Engineers' Department	.. ..	£2	10 0
Traffic Department (*a*)	.. ..	1	4 0
,, ,, (*b*)	.. ..	2	10 0
Head Office		4	0 0

The total number of grants made since the society started is 86, and the amount disbursed £234 9*s.* 6*d.*

Donations received—

National Telephone Company, Limited		£11	8 9
Mr. C. W. Appleby		0	3 1

The number of members at the end of May was 2,855.

THE
National Telephone Journal

VOL. III. AUGUST, 1908. No. 29.

TELEPHONE MEN.

XXVII.—WILLIAM WILSON COOK.

MR. COOK was born Feb. 2, 1867, at Egremont, Cheshire, and was educated at the Wallasey Grammar School. He was an apt scholar, as he passed the Cambridge Junior examination at the age of twelve, and two years later he took first-class honours with special distinction in mathematics. Apparently he did not entirely neglect sports for learning, as for some years prior to his leaving school in 1883 he was captain of the school and of the first football team and of the first cricket eleven.

Shortly after leaving school Mr. COOK began his telephone career with the United Telephone Company in May, 1884. His earliest practical work was "curling" cables for the first subscribers' multiple switchboard installed in London at the historic exchange in Chancery Lane. At that time Paddington Exchange consisted of a 50-line "Bell" switchboard in a room opposite Edgware Road Station, and East was a 50-line board of the same type placed in an attic of the Eastern Hotel. All lines, both for subscribers and junctions, were overhead, earth circuit, and were built with $\frac{3}{16}$-in. stranded iron wire on shackle insulators. When the equipment of the Chancery Lane multiple board was finished, Mr. COOK was transferred to the Fault Department, which at that time had its headquarters at Oxford Court and operated over the entire Metropolitan area, so that it was no uncommon thing to be sent from the East-end to the West-end of London to attend two consecutive faults.

The telephone service anticipated the Navy in the practice of giving young officers an all-round training, and in accordance with this excellent practice Mr. COOK was next sent to work as an operator at the Central Trunk Exchange in Oxford Court. After a few months practical experience at the switchboard he was transferred to the exchange electrical staff, which then carried out all the construction and maintenance work in connection with the London exchanges. During this period Mr. COOK was attending classes at the City and Guilds Technical College, Finsbury, and about this time he had charge of the erection of the first Western Electric multiple switchboard installed in London at the premises in Queen Victoria Street, now known as Bank Exchange.

He later became head of the exchange equipment staff, and had charge of this branch of the work until after the amalgamation of the United with the National Telephone Company in 1889, which resulted in a change in the organisation of the whole telephone staff. As a result of the reorganisation Mr. COOK was appointed Electrician of No. 1 Division, with headquarters at London Wall; his duties as Electrician were afterwards extended to cover the whole of London. About this time the work of converting the line plant in London to metallic circuit was taken in hand, and provided an extremely busy time for all hands. The problem was difficult, complicated and extensive, and in many cases circuits and apparatus had to be specially designed to meet the new conditions.

One of Mr. COOK's important tasks at this time was the preparation of the specifications for the first branching switchboard equipped with self-restoring indicators. This was installed at the Avenue Exchange under the supervision of Mr. COOK, but owing to difficulties in completing the London outside work a similar switchboard at Hull got to work first. The Avenue Exchange was opened for service in 1893, and was the first really large exchange on the branching system in the country; it is interesting to note that it is giving good service to-day. Shortly after the opening of Avenue, the maintenance of the trunk lines between London and Coventry was added to Mr. COOK's other duties.

In February, 1896, he was appointed District Manager at Nottingham, which district then included Leicester, Derby, Lincoln

and Burton. While in this position he prepared the underground schemes for all these towns.

In December, 1898, Mr. COOK left the National Telephone Company, but did not abandon telephone work, as he became head of the Telephone Department of the Western Electric Company's London branch, and afterwards became Works Manager in the same business. In this position he installed the first common battery switchboard in Europe, at Bristol, an experiment which at the time was regarded with great interest, not unmixed with apprehension. The early advocates of common battery working had a very uphill battle to fight, and, in these days when common battery is generally accepted as the standard method, it is difficult to realise how strong was the opposition to the introduction of the system at first.

In his work for the Western Electric, Mr. COOK enlarged his experience considerably. In 1901 he visited Portugal for the purpose of advising on the reconstruction of the systems in Lisbon and Oporto; as a result underground schemes were undertaken in both cities, and a common battery equipment was installed at Lisbon and a branching board at Oporto. In 1902 he spent three months in America, studying telephone factory methods and the working of the large telephone systems in the principal American cities, visiting among other places New York, Philadelphia, Chicago and Boston.

Early in the year 1903 the Company asked Mr. COOK to return to its service, and accordingly he then came back to the National Company as Assistant Engineer-in-Chief. Of his work since then, it is difficult to speak adequately; during that period the Company's engineering methods have been largely altered, and in all this, as well as in the many problems where business and engineering are allied, Mr. COOK has played a very large part. Many of the engineering methods now in everyday use by the Company's staff are due to him, and he has left a mark which will not be readily effaced. To select within the limits of this notice any special matters is almost impossible, since there is no phase of the work in which he has not been actively engaged with success.

About the year 1891, the writer came into contact with several men doing pioneer work, and among these was W. W. COOK; the recollection of the favourable impression made by him is still strong in the mind, and has only been strengthened by years of more intimate knowledge. Under a very quiet demeanour he hides a strong will, a vivid sense of proportion, and a keen judgment of men and things. Partly by method and natural ability, and largely by an unusually accurate and analytical manner of thought, he accomplishes an immense amount of valuable work; like most of the Company's men who have made their mark, he is a great believer in the future of the telephone industry, and at the same time, a strong advocate for higher mental equipment and training among those by whom that industry is to be carried on.

He is Chairman of the Expert Committee, dealing with all technical suggestions, and is a member of the Institution of Electrical Engineers, having joined in 1891. His recreations are like his work, many sided, and include golf, tennis, gardening and bridge.

NOTES ON THE DESICCATION OF DRY-CORE CABLE.

BY CHARLES F. STREET, A.C.G.I., *Engineer-in-Chief's Department.*

IN modern telephone cables paper is the insulating material. In order that the insulation may be thoroughly efficient for practical work, it is necessary that the paper shall be perfectly dry. The necessary degree of dryness is obtained during the manufacture of the cable by subjecting it, in an oven, to a temperature of about 230° F. for varying periods, up to two or three days. Although every precaution is taken to exclude atmospheric air from the cable when in use, yet it is found that in a large number of cases sufficient moisture finds its way into the cable to reduce the insulating properties of the paper.

The method now employed for remedying this evil is to force specially dried air through the cable, thus causing the dry air to pass over the moist paper in the cable with the object of absorbing moisture therefrom.

It has been suggested that a more efficient method of extracting the moisture would be to open the cable sheath at one point only and to connect this opening to a suction pump, the advantage claimed being that by the production of a vacuum or partial vacuum within the cable the rate of evaporation is increased, and thus the rate of extraction of moisture is increased.

It should be noted that in this method, known as the vacuum system, no attempt is made to dry the air, but the process is merely to decrease the air pressure inside the cable so that moisture within it evaporates to fill the space formed by the removal of the air or water vapour by the pump. The following table shows how the rate of evaporation of water increases as the pressure decreases:—

Pressure.		Weight (in grams) of moisture evaporated in 30 minutes at 45° F.
Inches of Mercury.	Lbs. per square inch absorbed.	
0	Atmospheric 15·0	1·24
15·2	,, 7·6	2·29
22·8	,, 3·8	5·68
26·6	,, 1·9	9·12
28·5	,, ·95	15·92
29·45	,, ·47	29·33
29·92	,, ·235	50·74

In making a comparison between two such systems it is necessary to define carefully what is meant by a better method of extraction of moisture. Whether for the expenditure of a certain amount of work, or for a certain cost, or within a certain time, the weight of moisture to be extracted is to be a maximum.

In a series of tests carried out by the writer it was decided to use two pumps of the same dimensions, one a suction and the other a discharge pump, and to express the relative merit of each system by the weight of moisture removed from the object to be dried for a certain number of revolutions of the pumps in the same time. There are, of course, many other ways of comparing the two systems which might give entirely different comparative merits to the systems.

For the purposes of the test referred to, damp cotton wool, contained in glass tubes, was experimented upon by each system in turn, and it was found that the weight of moisture removed from the cotton wool by passing dried air through it was ·722 gram for 1,000 revolutions of the pump, whereas no loss in weight could be measured with similarly damped cotton wool after 1,000 revolutions of the suction pump with a vacuum of 25·5 inches of mercury.

In any case, whatever measure of success might be achieved by the vacuum system under laboratory conditions by obtaining a greater vacuum (assuming such could be obtained in practice also), there would always be a danger of the existence of a very small perforation in the sheath, which, with the diminished pressure inside the cable, would permit undried atmospheric air (and in some cases water) to enter the cable, and so reduce it to a far worse condition than it was when the drying commenced.

In the system of drying cables by pumping dry air through them, the desiccator, it may be explained, is the name given to an apparatus which is constructed to dry the air before passing through the cable.

There are a few materials which have the useful property of absorbing moisture from surrounding objects. Such materials are largely used for desiccators, or dryers. Perhaps one of the commonest of these materials is chloride of calcium, a compound of calcium and chlorine, which is frequently, though incorrectly, termed calcium.

Calcium, it may be mentioned, is a valuable metal, costing about 24s. per lb. Calcium chloride costs about ½*d.* per lb.

It has been found that the calcium chloride used by the National Telephone Company will absorb about its own weight of water. It has been determined also that if a crystal of this material be left in the air for a short time it becomes covered with a film of moisture. Prolonged exposure would show that the crystal gradually dissolves away, while the weight of the liquid so formed

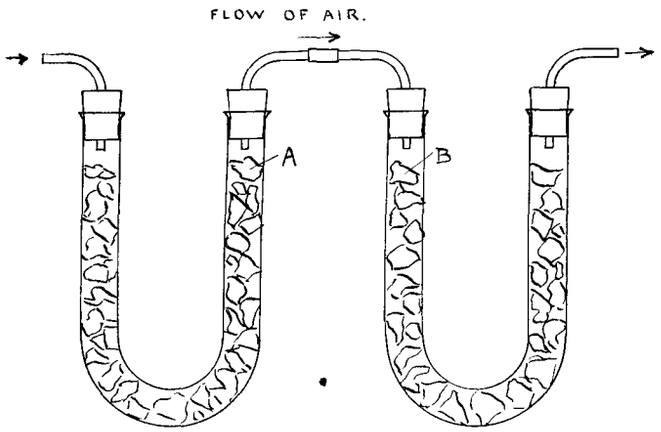
continues to increase, even after the crystal has completely dissolved.

In chemical factories and premises where air has to be dried in large quantities, a novel method of freezing it is employed. By this means the moisture present in the air is converted into ice or frost and drops to the bottom of the receptacle as a solid, and the cold air passes on almost entirely free from moisture.

The type of desiccator which is generally used in our work causes the air, before it enters the cable, to pass through cylinders containing perforated trays filled with calcium chloride. This air, in passing through the perforations, comes in contact with the calcium chloride and gives up its moisture to it.

Whilst making a series of tests to determine the relative efficacy of different types of desiccators, a valuable principle has been deduced. It was noticed that when air was passing through two glass U-tubes in series that the first crystal in each of the two tubes became very moist, particular attention being attracted by the moistness of the first crystal (B) in the second U-tube, and the dry condition of the last crystal (A) in the first tube.

Since the air which has passed over the crystal (A) must necessarily pass over the crystal (B), it followed that there must be some difference in the conditions which enabled the crystal (B) to extract more moisture from the circulating air than the crystal (A).



It will be noticed from the sketch that the junction between the two tubes is effected by a small glass tube.

In consequence of the small orifice at the point where the air enters the second U-tube, the linear speed of the air at this point is much increased; the air impinges on the crystal (B) from a nozzle, and it was easily proved experimentally that by causing the air to impinge from a nozzle on a crystal more moisture was extracted than by allowing the air to circulate slowly.

Although it has been shown that the rate of extraction of moisture from the air is increased by the use of a higher linear speed, it appears that there must be a limit to the beneficial effect obtained by this means, and a test was therefore carried out on the following lines:—A series of tests were made in which the same volume of air was made to pass through nozzles of various sizes in a given time, so that the linear speeds of the air proceeding from the nozzles depended upon the diameter or area of each nozzle, the speed being inversely proportional to the area of the nozzle. The jet of air issuing from each of these nozzles was in turn made to play upon a crystal of calcium chloride of a known weight and the increase in weight noted, with the following results:—

Linear speed in feet per second of the impinging air.	Increase in weight in a given time.
17	·0105 grams.
20	·0142 „
100	·02 „
194	·017 „

If these figures be plotted as a curve it will be seen that the maximum rate of extraction occurs when the linear speed of the air is between 90 and 110 feet per second. The experiments were not delicate enough to state the critical speed more definitely.

This principle is being tried in the modern desiccators of the National Telephone Company. The jets fitted are calculated to give a linear air speed of 20 feet per second, when the discharge of air through the desiccator is 5 cubic feet per minute. It is not desirable, however, for other reasons to obtain such a high speed as 100 feet per second, as the pressure necessary to force the air through the jets at this speed would cause a considerable loss of power and would necessitate a very high initial pressure at the pump.

It would be not be out of place to mention here a mistake, which is frequently made with the present system of pumping, concerning the laws connecting the discharge of air through the cable and the air pressure at the compressor when driven by a constant speed prime mover. This mistake arises through comparing the discharge of air through a cable from this source, with the current which flows through a wire resistance connected across the terminals of a battery. In this latter case the current is directly proportional to the resistance of the wire (neglecting the internal resistance of the battery); but in the case of the constant speed compressor the rate of flow or discharge of free air in a given time is constant, and is entirely independent of the frictional resistance of the cable. The discharge of air from a compressor depends upon the volume swept out by the pistons; and when the compressor is driven by a constant speed motor the discharge of air is also constant. The essential difference between the two cases cited is that in the case of the battery and resistance the electrical pressure is fixed and the electrical flow variable, depending upon the resistance of the wire. In the case of the compressor the flow of free air is fixed and the pressure variable, being dependent on the frictional resistance of the interior of the cable.

A common example which demonstrates that this is not thoroughly understood, is found in the case of pumping a cable with a constant speed compressor. Under this condition some form of choking device is frequently placed at the point on the cable where the air escapes, for the purpose of impeding the outlet of the air, on the grounds that "it prevents the air from coming out so quickly." This assumption, as already pointed out, is erroneous. When steady conditions are obtained, the air must come out of the cable at exactly the same rate as it enters, and the effect of the throttling device referred to is merely to increase the air pressure within the cable, and consequently to decrease the rate of evaporation and to use more power to drive the compressor.

NEW BUSINESS: RESIDENCE STATIONS.

By T. A. BATES, *District Manager, Chester.*

THE paragraph written by Mr. BRIAN GIFFORD in the January JOURNAL contains one line that I think might receive a little additional prominence still, "What a field we have before us." I will take this as my text.

The art of getting new business is perhaps not as simple on first sight as it might appear. There is always the temptation to follow the line of least resistance, which in this case lies in paying too much attention to the canvassing of ground that is most likely to give the quickest return for any outlay of time and patience on the part of the contract officer.

The easiest stations to pick up in most places are those in business and professional premises within a short distance of an exchange. The hardest to acquire, and infinitely the most valuable at this stage of the day are residence stations, and there is no doubt about it they are on the whole very difficult to obtain—a phenomenon that is apparently not confined to this country.

The contract officer in the first place must be *most carefully* selected for this work and of good education and smart personal appearance. He must be endowed with considerable energy and tact, and must be prepared to spend a large amount of time in making calls—often at a considerable distance from his home centre—without getting the desired interview.

This may seem discouraging, but I believe in the strongest possible way that this is the business to go for above all others. A paraphrase of the old adage of taking care of the pence might aptly apply to the obtaining of these private residences, as

when they are secured other classes of "business" follow in automatic sequence. The extraordinary thing about it is that it is the private house after all to which a telephone, in many cases, is of the greatest service. I will go further and say that any private householder living in a house rented at £35 and upwards that refuses telephone service refuses, at the same time, the best insurance against illness, fire, and a thousand and one other domestic emergencies and exigencies that it would be possible to imagine.

If this branch of the work is tackled seriously—with the knock-out shots that a suitable contract officer is able to fire off—it is certain that great and continuous results will follow.

The difficulty in obtaining many of the better class private residences lies in the fact that they are often at a considerable distance from an exchange, and the extra mileage charges that have to be imposed have exerted in many cases a fatally deterrent influence. We have met the difficulty in this district by establishing small outlying exchanges, in some cases consisting of nothing but private houses. In the last twelve months we have opened twelve exchanges, of which six practically consist of residence stations only.

The result has been far reaching. Tradesmen who were not previously connected have been brought into the fold. Others who were considering giving up the service have retained it. Towns that had been practically moribund for years have experienced what I cannot better describe than as a telephonic revival. In one town alone, through the opening up of a residential neighbourhood that had been supposed to be inaccessible through wayleave difficulties, the increase in twelve months has been 30 per cent.

The question of expense of establishing these small exchanges must be carefully considered, but not judged too strictly on the actual canvassing result obtained at the outset.

I would point out that maintenance charges can be considerably reduced in cases where future development is likely to be small by installing the local exchange in the village Post Office, on the shop exchange principle.

We have opened five in this way in the last year. It is found that the objections on the part of the subscriber that are frequently raised to shop exchanges—sentimental ones, no doubt, in many cases—do not, as a rule, extend to the postmaster, who being already a public servant, and often a *persona grata* to the residents of the place, can not only safely be entrusted with charge of the exchange, but be confidently relied upon to give a good service, which, in my experience, I am glad to say has been justified.

With the introduction of the measured rate tariff, which is particularly applicable to this class of business, the future—the limited future, unfortunately—does offer enormous opportunity; and it surely behoves every member of the staff to plank down his big or little contribution now in the furtherance of the gentle art of getting new business, that when Dec. 31, 1911, arrives we shall be able to ring out the old Company to some tune.

SHEFFIELD UNIVERSITY EVENING CLASSES.

THE following successes have been obtained by members of the staff during the session 1907-1908:—

E. S. Byng, third stage practical mathematics, first class; first year applied mechanics lectures, first class; first year mechanics laboratory, first class; ordinary stage telegraphy, first class.

Alf. H. Grindrod, second year electrical engineering, practical, first class; second year alternating currents, second class; second year applied electricity, second class; second year applied magnetism, second class; honours stage telephony, first class.

G. C. Christie, first year electrical engineering lectures, first class; first year electrical engineering, tutorial, second class; first year electrical engineering, practical, second class.

J. Wright, ordinary stage telephony, first class; preliminary stage mathematics, first class.

F. Smith, ordinary stage telephony, first class; first year electrical engineering, practical, second class.

E. Chappell, first year electrical engineering lectures, second class; first year electrical engineering, tutorial, second class.

H. Richardson, ordinary stage telephony, second class.

W. T. Woodhouse, ordinary stage telephony, second class.

H. Hemington, ordinary stage telephony, second class.

H. Shaw, ordinary stage telephony, second class.

H. Baker, first year electrical engineering lectures, second class.

BRISTOL EXCHANGE SWITCHBOARD.

BY A. PERKINS, *District Manager.*

IN view of the recent additions to the Bristol switchboard and testroom it is thought that a short description of the exchange will be of interest to readers of the JOURNAL. The original switchboard, which was opened early in 1900, was the first central battery equipment in Europe; it was being tried largely as an experiment, as a result of which much useful knowledge has been gained. The capacity then was for 1,800 lines, with an additional junction section of three positions. There was also installed a "two-position" exchange manager's desk fully equipped with the usual apparatus for observing the service, testing on head lines, etc.

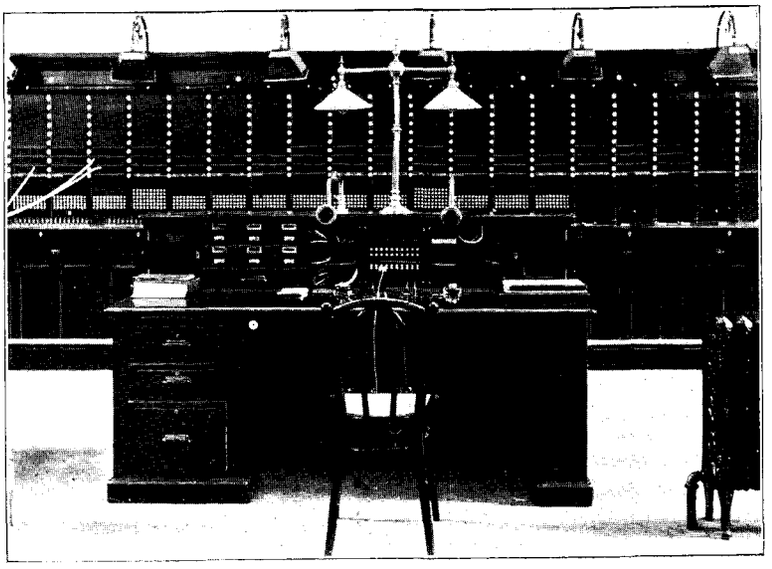


FIG. 1.

This was seven and a half years ago, and it will of course be quite understood that owing to the rapid growth of the system many changes have been rendered necessary during that time in order to keep pace with requirements and to bring the equipment up to date and so provide for all the varying needs of the service.

FIG. 2.

The introduction of party line service necessitated the provision of means for reversing the ringing current. This was done by a common reversing key on each position, the actual line equipment remaining the same as in the case of direct lines.

At the commencement the answering jack equipment for each operator was 100 lines, but the question of the operator's load has

been made a matter of scientific investigation, and as a result it has been found that one operator can work more than 100 lines. The equipment has therefore been increased to 140 lines per position, and it is anticipated that with the growth in measured rate subscribers and the consequent decrease in the calling rate this number will be still further increased.

Two additional junction positions have been fitted, see Fig. 2 (there were three originally), and all have been equipped with

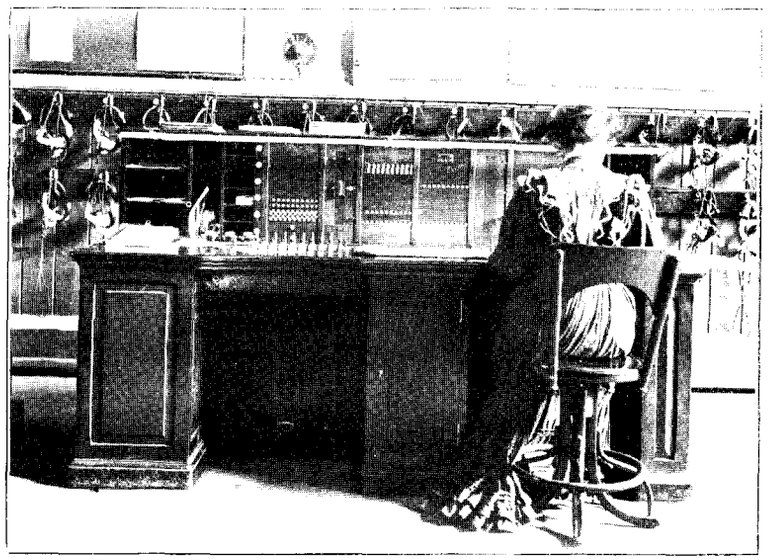


Fig. 3

four-party line and direct ringing keys. This makes five junction positions. The first three "A" operators' positions also (adjacent to these five) are now being converted to junction positions, which will then make eight in all. There are now 22 sub-exchanges in the Bristol area, and the daily incoming and originating traffic is at present 3,500 and 36,000 calls respectively. A two-position monitor's table has also been fitted on standard lines; all enquiries are dealt with here.

At the end of the "A" sections a testing operator's position has been fitted. All docket faults are passed *via* this operator, who,

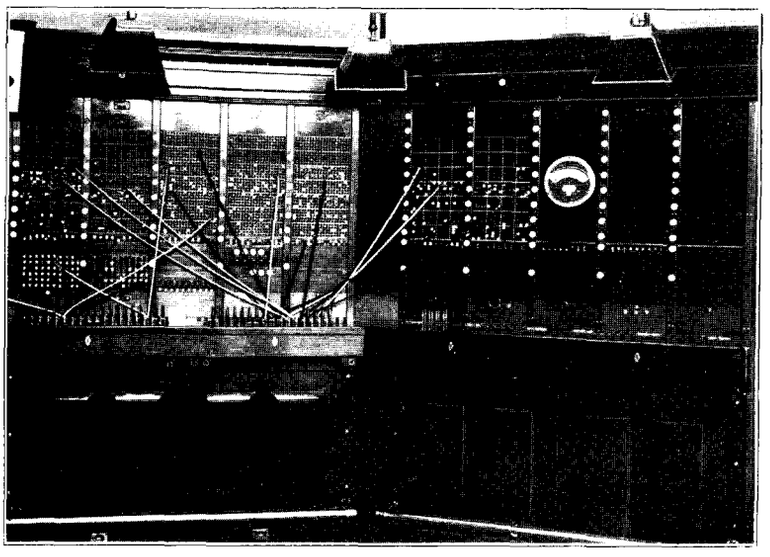


Fig. 4

prior to forwarding them to the department required, makes an initial test by means of a Weston voltmeter set. This operator is also in circuit with the testing officers who make their various tests through the position.

All the new sections recently fitted were provided with register keys for the automatic registration of calls, this system supplanting the old method of ticket recording. It was also essential that these keys should be fitted to all "A" positions. The keyboards at these latter therefore have all been widened sufficiently to allow of this being done. The registers were brought into use on June 1, 1908.

All the service lines in the building (120) have been centralised on a private branch switchboard in the switchroom, this being placed in line with the monitors' table. There are ten junctions between the branch exchange and the main switchboard.

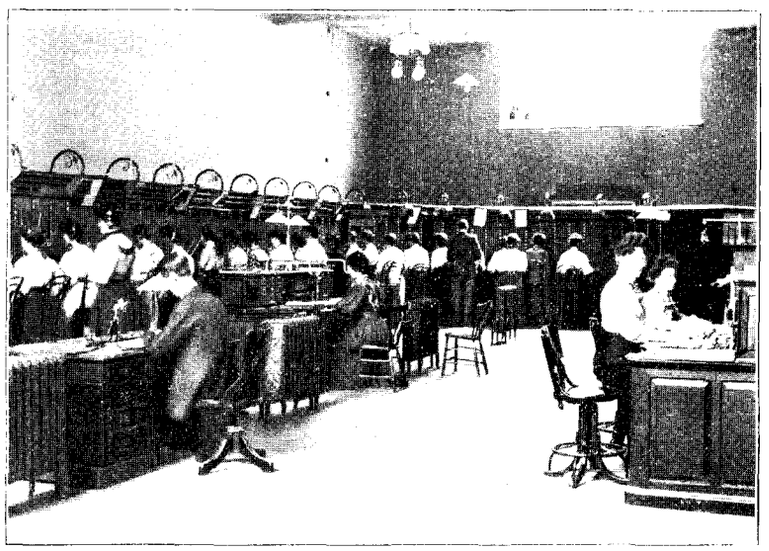


Fig. 5.

The present multiple capacity of the main board is 4,900, with an answering jack equipment of 4,920. It has been estimated that this equipment will be sufficient to last to January, 1912, but some of the officials are optimistic enough to think that much addition will be necessary before that date.

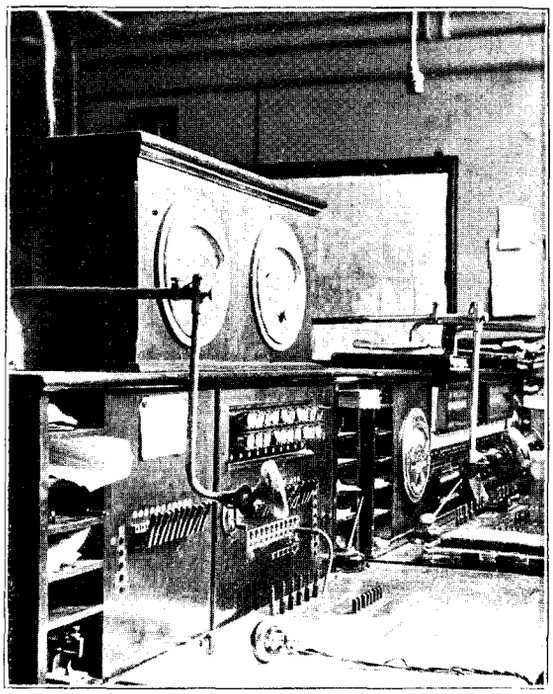


Fig. 6.

The junction or "B" positions number five, the subscribers' or "A" numbering 33. Twenty-three of these latter are already occupied, so that there are 28 working positions at present in use.

The testroom, power room and accumulator rooms are situated in the basement, and the leading-in cables enter the building at one corner of the testroom, which, of course, is below the level of the street.

In 1900 (when the exchange was opened, as previously mentioned) no standard test clerk's desk was in use, but experience quickly showed that the locally made desk was not adequate to the demands upon it, and very soon a "one-position" desk was required, and this has grown to two "two-position" desks.

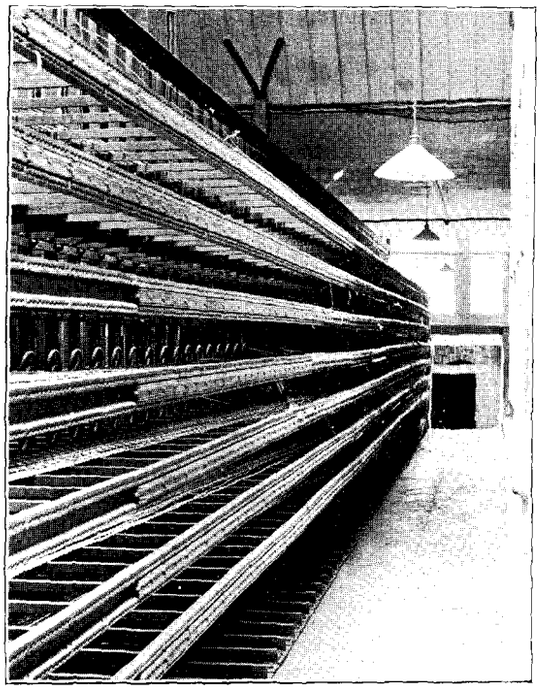


FIG. 7.

The original home-made desk before referred to has been reconstructed, provided with voltmeter test-ring and placed at the back of the main frame for the use of the linesmen and cross-connectors.

The testroom itself has been extended to accommodate a big extension to the main frame and also the register racks, containing the registers upon which subscribers' calls are recorded.

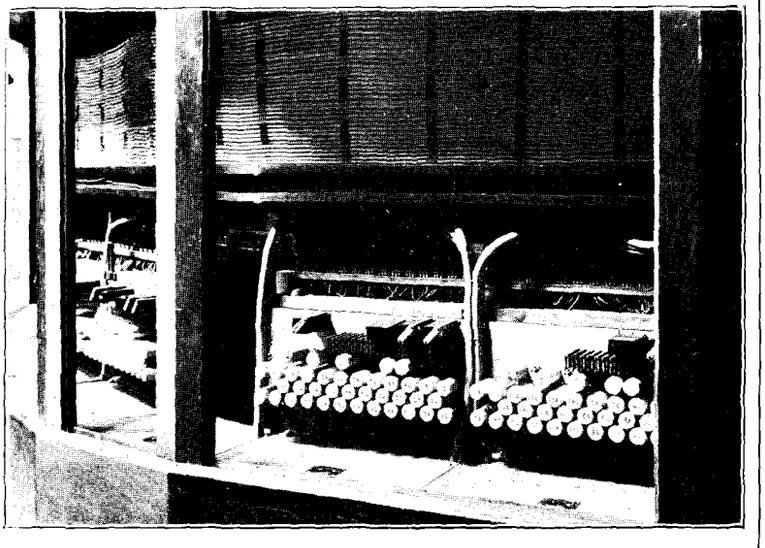


FIG. 8.

There is an intermediate distributing frame running parallel with the main frame. Upon this intermediate distributing frame have been carried out, within the past few months, the whole of the cross-connections required by the redistribution, amounting to over 3,000.

The charging plant fitted in the power room consists of two 200-ampere dynamos, one driven by a 12 horse-power Crossley gas engine, the other deriving its power from a Langdon-Davis alternating motor worked from the Corporation mains. The gas engine also works the standard dry-air pump when required. The two ringing machines are of the usual standard type, equipped with tone and busy back drums, and are worked off the 24-volt battery. A third dynamotor, worked from the same motor, supplies 40 volts for the voltmeter on the test clerk's desk.

The accumulators are of the usual chloride type as used at all the Company's exchanges, the capacity of the main battery having been recently increased from 770 ampere-hours to 1,340 ampere-hours.

The foregoing remarks briefly outline the present condition of our exchange and test departments at Bristol. An additional photograph has been taken of the back of one of the new switchboard sections (Fig. 8) which will convey an adequate idea of this portion of the work. This although out of sight is not "out of mind" or the least important.

MEASUREMENT.

BY F. GILL.

IN the recent KELVIN lecture on the "Life and Work of Lord KELVIN" before the Institution of Electrical Engineers, Professor S. P. THOMPSON says:

"THOMSON'S mind was essentially metrical. He was never satisfied with any phenomenon until it should have been brought into the stage where numerical accuracy could be determined. He must measure, he must weigh, in order that he might go on to calculate." And then he goes on to quote from Lord KELVIN himself in his lecture on Electrical Units of Measurement before the Civil Engineers in May, 1883. "I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of *science*, whatever the matter may be. . . . The first step toward numerical reckoning of properties of matter, more advanced than the mere reference to a set of numbered standards, as in the mineralogists' scale of hardness, or to an arbitrary trade standard, as in the Birmingham wire gauge, is the discovery of a continuously varying action of some kind, and the means of observing it definitely, and measuring it in terms of some arbitrary unit or scale division. But more is necessary to complete the science of measurement in any department, and that is the fixing on something absolutely definite as the unit of reckoning."

From this it is clear that KELVIN felt that until one could put one's ideas into numerical form the knowledge at the bottom of those ideas was unsatisfactory, and as a corollary that discussion bearing numerical expression was in advance of mere expression of ideas without measurement.

Is not this true of our work as well as of other spheres of industry? We have all seen men (and have probably done the same ourselves in the past) indulge in trains of thought and plan schemes into which the idea of measurement never entered, and who were consequently unable to give any answer to the question which always arises, even though delayed for a long time—How much? As a natural result these schemes have been unsatisfactory to a greater or less degree. On the other hand we have seen what a grip is acquired on a subject once it has been subjected to satisfactory measurement and its dimensions are known.

The bearing of this on telephone work is fairly obvious, even though it is not always observed. In the three phases of telephone work—the original planning of the works, the maintaining of those works, and their replacement by others—it is possible either to proceed along lines which involve measurement or on those which do not. In speaking of works the expression is not to be taken as relating to plant alone; the same is true of all the activities of the various offices. But there are some minds which seem instinctively to rebel against figures, and, considering them as unreal, prefer to deal with their problems on a general basis by argument. Many will remember in old days discussions regarding certain types of switchboards in which the merits of different systems were estimated

from the number of actions which an operator had to perform in making a connection. Prominent in this matter was the case in which the call wire system was conclusively proved by its advocate (to his own satisfaction, if to that of no one else) to be superior to the indicator system. Here was measurement of a kind, but clearly a useless measurement.

Other examples of neglect to measure are easy to multiply, but some are worth referring to in detail. The temptation to make a new rate or vary an existing one without fully measuring all the factors in the case is ever present, likewise is the almost similar difficulty as to which rate it is advisable to push and which to refrain from pushing.

Or again, if we consider the planning of an exchange building, how often has the site been decided upon without due regard to the economics of the problem; whether there should be a building at all, and if so what is its most economical situation and size. Exchanges have frequently been built in places determined solely or mainly by the idea that here was an alleged suitable building ready or that land was cheap.

When the question of replacement of plant or methods arises, measurement is equally necessary; if properly viewed it is obvious that the question, "Why should the contemplated replacement be made?" demands an *adequate* answer, and it is not adequate to say that it would be a good thing to do, or that the service would be improved; the answer is not a good one, even if one goes to the length of saying that "the service will be very much improved" or will be "much cheaper to maintain"! And yet how often is this answer heard, especially about replacements? It is true that it is often difficult adequately to measure the worth of an improvement, but that does not do away with the necessity of trying to do so as accurately as our knowledge will permit, and of realising and expressing those factors in the case which we are unable to measure. By such a method one does at least follow a sane plan to the limits of one's powers, but the method (or rather want of it) of advocating a change without any attempt to arrive at the dimensions of the factors is not worthy of those from whom it sometimes proceeds.

Under the same head comes "panic legislation"; here lack of measurement is aggravated by distortion and magnification of one or more of the factors; the rest are forgotten until the inevitable happens, and the panic laws are withdrawn.

The rebellion against figures above referred to leads sometimes to a very peculiar situation, which, were the matters concerned not so serious, would often be amusing. This point is very fully dealt with in the paper on "Telephone Engineering," by Mr. J. J. CARTY, reprinted in the first and second numbers of the JOURNAL, and to which reference should be made by any who have not read the paper or have forgotten it. Incidentally, it is difficult in writing on development matters, to avoid touching on ground already covered by Mr. CARTY; he has done so much splendid work on this as well as on other telephone matters, that one is practically sure of moving over ground in which he has already laid foundations. But to return to those who will not measure. In planning something for the future, say, an exchange building, they will say, one cannot possibly tell what number of lines there will be in the exchange at a date many years ahead, nor what will be the calling rate then, nor what the capacity of the operator as regards load. And yet in the same breath they will say that the new switchroom shall be (say) 125 feet by 39 feet, apparently unable to see that in deciding the size of the room, they have decided (without any consideration) what the number of lines on the exchange, the calling rate and many other factors are to be. But the evil goes further than that; when the apparatus room is dealt with, it is handled in the same irrational manner, with the result that a *different* capacity is planned for; other different capacities are arrived at in dealing with the operators' quarters, the cables entering the building and so on with each unit of the building. After a few years the whole is an ill-assorted collection, instead of the harmonious design it might have been.

The case of an exchange building has been taken simply for illustration; the same is obviously true of any office or shop, but I have seen it gravely stated that a firm which had gone into new premises had been compelled in a few months to move again into larger premises because its business had so largely grown in the interval. It is constantly evident that what is really due to want of systematic planning for the future becomes a theme for a panegyric on the extraordinary growth of the business!

To avoid this state of things requires that consideration and time shall be devoted to the planning of things, whether it be the building of exchange premises, or an estimate to renew a route of poles; it is obviously false economy and false haste to rush into work which has not been fully considered. Unfortunately the penalty for much hastily conceived planning is long delayed, and thus the advocate of non-measurement goes on his way rejoicing, only pulled up by the inevitable when perhaps most people, including himself, have forgotten the original scheme. But the costs never forget and never take kind-hearted views; they are as inflexible as fate.

When a matter under discussion can be reduced to accurate figures, it can be discussed with greater clearness of thought and in a more judicial manner than when its measurement is vague or non-existent. It is frequently said that some subjects cannot be expressed numerically, and the idea is even held that such subjects are on a higher plane and relate to superior matters than do those which may be submitted to measurement. This was evidently not KELVIN's view, he held that such kind of knowledge was "meagre and unsatisfactory," and we know that many subjects which at first sight do not appear to lend themselves to numerical form can, when closely studied, be advantageously expressed in that manner. It is undoubtedly true that with the advent of measurement comes a very great advance in any science or art.

MICROBOPHOBIA.

SUPPOSE you are a simple man
Of normal habits,
You keep as cleanly as you can,
And do not try the subtler plan
Of swabs and rabbits.

Your telephone's receptive spout
Wherein you bellow,
Some moisture holds without a doubt,
But you, you merely wipe it out.
Poor simple fellow!

You wipe it out and keep it clean—
Vain self-reliance!
Think of the germs that writhe unseen,
When with more luck they might have been
Employed by Science.

Were you a scientific swell
Who wished to shock us,
And able at a glance to tell
The diff'rence 'twixt a cockerel
And metacoccus,

On lifeless rags you would not waste
The germs, but waiting
Would find some creature to your taste,
And end by guinea-pigs in haste
Inoculating.

The germs the pigs may slay or spare,
But each that dies is
Used the poor Public so to scare,
That every horizontal hair
Vertical rises.

"Death in the 'Phone!" The Press aflame
Bewilders gapers,
Of course you do not thirst for fame
But incident'lly find your name
In all the papers!

—W. H. GUNSTON.

SOME OBSERVATIONS ON STORES AND STOREKEEPING.

BY A STORES CLERK.

THE importance of the correct keeping of stores does not appear to be fully recognised. This may be due to

1. The large number of items, many of them insignificant in size and value, comprised under the general designation "stores" and the amount of detail involved in the aggregate in dealing with them.

2. The practice carried out in the adjustment of stock. In money matters the Company demands of a cashier that he correctly reconcile his cash to a penny, yet in stores (money in kind), a deficiency of a pole, an instrument and such like, to the value of from £1 to £3 each, is written off year after year with little or no comment.

Whatever the cause may be, its effect is a bad one and its early removal would be beneficial. Granting the impossibility of keeping stores as a whole as correctly as cash, and making every allowance for the numerous trifling yet necessary articles, there still remains that as regards the great part of the items dealt with, it should both be possible and easy. To make the possibility an actuality, far-reaching and wide, is the duty of the stores clerk. This official, if painstaking and zealous in his work, will continually have before him the problem of occurring and recurring errors, and as continually will he be seeking such a solution as will reduce the liability to error to a minimum.

To aid in accomplishing this, a few simple points and suggestions are made. So far as they have been put into operation, they have proved beneficial and yielded good results. This, too, in a district which, though far from being the largest, yet is dealing with stores to the value of £15,770 for three months, necessitating the transcribing of from 1,900 to 2,000 foremen's requisition slips, which must certainly be considered a fair average.

The difficulties under which the stores clerk labours may generally be classified as follows:—

1. Being largely at the mercy of a more or less uneducated storekeeper.

2. The large number and varied character of the items dealt with.

3. The long periods which elapse before the proving and investigating of discrepancies.

That the clerk is mainly dependent upon the various storekeepers and issuers of stores for the correct and complete particulars relating to receipt and issue of stores is obvious, as also that unless they are ever watchful to see that no stores of any description come in or go out without being immediately recorded on the slip ultimately to be sent to the district office, it is impossible to keep stores correctly. Experience proves that the most careful and painstaking of storekeepers fail sometimes, and that the smallest centre is liable to get very lax in recording transactions. A simple yet efficient method to keep stores both normal and correct, is for the clerk to scrutinise carefully each requisition for fresh supplies as it reaches him and to make sure that the figures in column, "Quantity in Stock, etc.," are substantially in agreement with the records.

The "Quantity" and "Returned" columns on foremen's requisition slips look plain and simple, easy enough for even an illiterate man to understand, but frequently figures are put in the wrong column and the slip is accepted by the storekeeper without being noticed. This is a mistake, as it not only multiplies the figures erroneously shown, but is difficult to detect subsequently. To guard against this, give each foreman not only the usual piece of copying pencil for his issues, but also a red pencil, and make him show all returns with this latter. By this method black or red figures appearing in wrong columns can be enquired into and corrected as necessary.

Further, frequently the articles are wrongly described on the slips, incorrect numbers and sizes given, allocation inaccurately shown, and this notwithstanding that all slips should be examined and certified by the local manager or engineer. It would be more advantageous, and involve less liability to error if the examination were made by the foreman fitter, engineering inspector, or other official who directly supervises the job, rather than by the local manager or engineer whose supervision is of necessity only general.

Unfortunately even these safeguards do not prevent mistakes being made later in transcribing the foremen's slips to the issue sheets. These usually are in the quantities and are occasioned by various reasons illegibility and indistinctness of figures (*e.g.*, ozs. are shown 2 ozs. with 0 in quantity column, 0 and 6, 3 and 5, etc., written so much alike as to be difficult to distinguish); the clerk breaking off suddenly whilst transcribing a slip and on resuming not knowing exactly where he left off, assuming it to be so simple a task that the necessary care is not taken- and so on. To overcome this there appears to be only one of two alternatives. (1) So to alter the method of working that a detailed slip is used for issues similar to that now used for recoveries, thereby doing away with the transcribing altogether. (2) To have entries on issue sheets checked by an independent person.

Against the former a strong objection is urged, in that foremen will not book out as regularly and completely as they do with each having his own book of slips, and large deficiencies in stock will result. Against the latter the strongest objection is the additional work put on an already fully occupied district office clerk. The latter objection is valid; regarding the first, though the result forecast is admittedly possible, it would be solely due to slackness on the part of the storekeeper in not seeing that the very first principles of his office were being observed. The obligation is upon him now to see that the necessary entries are made before he gives out or takes in any article, and it would but mean the faithful continuance of this under a different form. Certainly the gain in time and labour in not transcribing would be great, the liability to mistake in the district office would be rendered practically *nil*, and the allocation of errors would be made easier, as in the event of any differences occurring the storekeeper could be referred directly from the slip to his copy.

The glancing through each letter card immediately on completion of monthly postings thereto and drawing attention to large quantity balances, overbookings, or items in stock for some considerable period without any issues (and maybe since added to by requisition) will help much in keeping a correct and normal stock.

There is a further important item—periodical stocktaking or checking of stock by comparison of actual material at each centre with district office records. On first consideration this may be deemed a big task, and elicit the remark "one stocktaking a year is quite sufficient." But actual experience proves it to be much less than it certainly appeared when first undertaken. In the larger centres the storekeeper, for his own guidance and protection, must keep some sort of a rough record or summary of his slip figures, otherwise he is unable to tell with certainty how he stands. The careful storekeeper will not make up the record (whatever form it takes) directly after the close of each working month, but will compare and agree his figures with his actual stock. On the call of the district office for totals of actual stock as at a given date he simply sends in his own records for comparison, and from these any errors that may exist are located down to certain months with little trouble and no correspondence. This much being done the actual tracing should not be difficult. If not convenient or profitable to have such a record in the smaller centres, keeping the stock down to normal requirements only will make the counting of it but a short demand on time.

The checking need not necessarily be for all the centres in one month; it could be spread over two, and these when the cash balances are not being agreed, say the fifth, sixth, eighth and ninth months of the working year, thereby making two independent comparisons for each centre during the year. This would not only ensure a good current effect—discrepancies traced and put right whilst fresh in the mind—but the work of annual stocktaking would be made considerably easier. The former is well illustrated by the following:—At the last comparison a storekeeper was found to differ in some half a dozen items. Investigation proved that he had duly received the slip from the fitter and issued the goods, but the slip had afterwards been cancelled in the local office without his being advised or the goods returned to store. On the matter being raised it was easy for him to trace and rectify, one month only

having elapsed; but if the matter had been left over some eight months it would have been difficult, if not impossible.

It may be argued that to do all this must necessitate extra assistance being given to the stores clerk. It has not been found so, however. Of course the introduction of new methods will inevitably cause a certain amount of extra trouble, and difficulty may be met from those immediately affected, who perhaps for long have been working in a certain groove and, failing to see things from the changed aspect, have no desire to depart from the old way. But these difficulties overcome and a systematic working obtained it will be found that not only is the usual clerical labour sufficient to do it all, but that an advantage in time will be gained.

This is obvious—the storekeepers will be constantly on the alert, knowing full well that everything sent in is being closely scrutinised, more care will be taken to ensure correctness before submitting returns, time will not be wasted in sending in requisitions (without troubling much as to necessity) in the hope that they may get through when it is known they certainly will not, whilst the short time spent daily in comparing the "Quantity in Stock, etc.," figures as given on requisitions with those of the district office will soon tend to maintain things at a very good level and make the trial stocktaking only another verification of an already good condition.

The popular cry to-day is "educate, educate." It can reasonably and rightly be applied to stores work. Educate the storekeeper, but above and beyond this educate the stores clerk, for a fully alive, up-to-date clerk, thoroughly conversant with his duties, will insensibly and inevitably influence and instruct the storekeeper upon whom he has to depend so much for facts and figures. To this end the following suggestions are made:—

Let some technical instruction be given him. In the larger districts the stores clerk embodies in his department, so far as his district is concerned, some of the functions of the Head Stores and Engineer-in-Chief's Departments, and between these offices and the centres he acts the part of a "go-between" with only a more or less theoretical knowledge of the many diverse matters which come up from time to time to aid him. If his knowledge were extended to make it also practical—in some degree, at least—many of the questions asked by Head Office could be answered more quickly and readily, many submitted thereto would not be necessary, and numerous misunderstandings would be averted. Such instruction should be to the extent of knowing not only the stock list name but the article itself, and the use to which it is put, and could be imparted by arrangement at various times and by various persons in the way found most suitable to the end in view.

The greater supervision of the storekeepers by enlarging the responsibility and increasing the power of the stores clerk. The idea here is to bring the storekeepers under the more immediate control of the district manager, and to arrange that the stores clerk should visit the stores at such periods and times as he thinks advisable to go into any books, records, slips, etc., held by the keepers of stock, to count any and such items of stock as he may elect, and compare same with the records; he should also occasionally interview the foremen, and go over routes to verify that the articles and quantities given on slips have actually been used and slips not tampered with or altered in any way after being handed over to storekeeper; he should ensure that goods are properly checked, weighed and examined on receipt, that no accumulation of old stock be allowed to take place, and he should impart such information and instruction as would do away with much correspondence now going on. He should make a report of his visits and observations at certain specified times to the district manager.

It follows, of course, that the stores clerk performing duties like these in addition to his own specific office work would have to be a thoroughly reliable, trustworthy official, fully alive not only to the responsibility but to the opportunities of the work he is called on to perform.

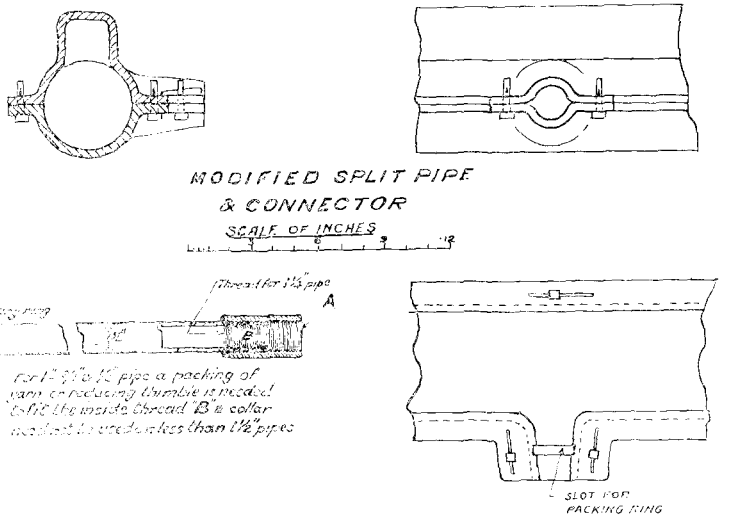
In the foregoing remarks only one phase of stores work has been referred to, viz., the close relation of the stores clerk and the storekeeper, and the dependence of the former upon the latter for the information which forms the pivot of all his work. From this it would appear preferable to have a poor clerk and a good storekeeper rather than a good clerk and a poor storekeeper: but far better is it to have *all* good, and my contention is that this is not only possible but practicable. The continual bringing home to all concerned the responsibility of the work, how it is not accomplished by slipshod methods and careless practices, the general uplifting of the ideas of stores and storekeepers to a higher level, with greater supervision and control, would result in additional satisfaction to the workers and in largely increased benefit to the Company they serve.

CRITICISMS AND SUGGESTIONS.

By J. STUART BEST, *Engineer, Cambridge.*

MR. TATTERSALL'S article in the April JOURNAL raises some very interesting points, and I should like to make suggestions under some of the various headings he mentions and some others.

Underground Distributions.—As there is little doubt this will increase in the future, I think something better than the existing brick boxes might be devised. Where small cables are carried out from the main, and where it is unlikely that a 3-inch pipe will be required, wrought-iron gas barrel of suitable size from ½ inch to 1½ inch clear bore, to be used with some simple form of connector for attachment to a modification of the existing straight split, would be much cheaper and remove the necessity for brickwork.

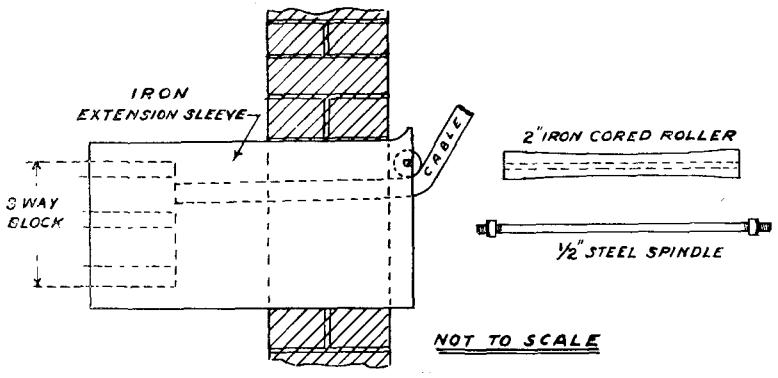


I show sketch of a connector (adapted for use with different sized pipes) which will illustrate my meaning.

Jointing Boxes.—While straight splits must remain the simplest and cheapest form of jointing space in a single line of duct in gravel footpath or country macadam roads, there can be little doubt that surface boxes would in the long run prove both cheaper and more convenient than sunk boxes or even brick pits with the 2-feet manhole cover (especially in town work, like the job we have in hand at present, where we have all kinds of roadways to contend with from sand and granolithic footpath to macadam with 9 inches of hard metal, and wood paving laid on the top of an 8-inch to 14-inch bed of concrete). A surface box something after the pattern of the Post Office double junction box, which enables the whole area of the pit to be uncovered, would be far superior to either sunk boxes or our usual small manhole, 4 feet by 3 feet by 4 feet, which is too cramped in room for a man to work conveniently in, especially when jointing and drying out a large cable. These should be at least 1 foot deeper, but if the whole top could be removed without disturbing the road surface it would greatly facilitate both drawing in and jointing.

Curves in the Pipe Line.—Mr. TATTERSALL'S idea of short pipes is an excellent one, if only for terminating at a bell mouth where sometimes it is necessary to cut; but, for curves, would not bends of easy curve and varying lengths such as the Post Office use be much better? We are now laying General Post Office pipes in the

same trench with our own, and where we have to cut several short lengths and take the risk of ragged edges, etc., they supply curves of a quarter to one-sixteenth in 4-feet and 6-feet 6-inch lengths which gives them an easy sweep. Our one-eighth split bend is often too sharp for corners, and also our solid quarter is of too small radius for heavy cables. The General Post Office stock them in several sizes to suit requirements; why should not we do so? I hold no brief for the Post Office; in many respects their engineering methods are not as good as ours, but in this respect they are certainly ahead of us.



Concrete Blocks.—The quality of these blocks varies greatly, some being of much rougher surface than others, would it not be an improvement if the entrance to the duct was countersunk slightly, and the whole inner surface and end of the block dressed with some hard drying preparation which would fill up the pores and leave a smooth surface, as the cable must suffer more or less when drawn over the sharp gritty cement? I would suggest some preparation of asphaltum applied hot.

We are using a good many of the new iron extension sleeves (S.L. 10) on our three-way blocks and find them very useful, especially where we are cramped for room (owing to gas and water mains, etc.) with our boxes. I think these might be improved considerably by having the arched portion slightly curved to form a bell mouth, to prevent the chafing of cable paid in from above or being drawn out, and also, by having some half-inch holes drilled at the sides about a quarter of an inch from the edge to carry a steel spindle on which a small roller would run loosely. This would act as a fender and ease the cable into the duct; two holes on each side would be sufficient.

I mention these sleeves specially, as it is probable that some of our engineers and local managers may not have seen them or know how useful they are.

Draw Rods.—From my experience with the existing pattern (having had to keep a gang working until after twelve o'clock at night while we dug down and broke out pipes to get a section of rod out after one had jammed and snapped off at the socket when superimposing cables), I know that a shorter and stronger rod might with advantage be used, and if built with a steel wire core, riveted to the brass ends, though more expensive at first their longer life and smaller risk of breakage, would more than compensate the extra cost.

Dry Air Testing.—Uniformity of Plant.—Now that we are having so many cases of dual cables in one area, which must all eventually come under one authority, it seems a pity that either we, or the Post Office, should not alter the air plugs so as to make them available for one standard apparatus. As it is, I know cases where the Company's cables join the General Post Office and there are two different sized plugs in use, involving for a local test different sets of connectors. This of course is a small matter, but might be a source of considerable inconvenience at some future date.

Drying Out Cable Joints.—Something better than the existing Swedish torch, with its concentrated heat seems to be needed here. Even the Post Office charcoal brazier, while being a very efficient and useful tool on account of its shape and large heating surface, is unsuitable, owing to the fumes, for use in a covered box—though it is an excellent thing for keeping the jointer's feet warm, which goes a long way towards having good work done on a winter's day. I had a modification of this made when on a very wet job, with open surface joints on a country road, and for use in an ordinary tent, where there is plenty of ventilation, it was far better than the benzoline lamp.

Joint Indicators for Country Roads.—Where it is not always possible to get fixed objects from which to take record measurements, could not a neat cast-iron tablet with foot for sinking be supplied for fixing in fences or against walls, with $\frac{T}{J}$ cast on it. I have lately had an experience of replacing cable, on a two-mile section of country road, where the positions of the joints had been marked with paint on oak fences, trees, etc., some seven years before, and in one particular instance I found some of the boards had been taken down during repairs and re-erected some fifteen yards away. Needless to say we did not find the joint opposite the mark, and in most cases the paint was so worn out that we only discovered it was there after we had located the joints by digging for them or from information received. Had tablets such as I suggest been put down when cable was originally laid, they would have saved many times their cost in labour.

Lubrication.—I am afraid this is a point on which some local managers try to economise, at the risk of efficiency. If they once had an experience of drawing in cables with very little grease or vaseline as against a similar cable well covered, I think they would never again attempt to save money on this article.

Rollers and Pulleys.—I found the use of one or more rollers laid between the drum and joint box very useful when drawing in, and I think these might be used with great advantage in all cases where it is not possible to erect the drum close enough to the pipe or box to give a clear run. Also, in drawing out, a roller placed for the rope to travel over saves a lot of friction, especially if a pulley is also fitted above the cable to fend it away from the pipe. I generally use a makeshift arrangement rigged up with a couple of oak arms, held apart at a suitable distance by blocks, and with wooden pulleys about 3 inches in diameter by 2 inches in the sheave. These also come in very useful when running overhead cable if mounted in an iron frame, so that they can be hung over an arm to take up the weight of the cable at different points, or draw rope a span ahead. By fixing ring bolts in the walls of boxes opposite the line of pipes or blocks, a pulley can be attached and the drawing in rope passed through it, thus giving a straight pull.

THE COMPANY'S CORRESPONDENCE CLASSES, 1907-8.

WE give below a circular letter which was issued during July by the Engineer-in-Chief, containing a report on the working and results of these classes for the past session, excluding only the references to certificates and schedules which accompanied the circular.

CORRESPONDENCE CLASSES, 1907-8.

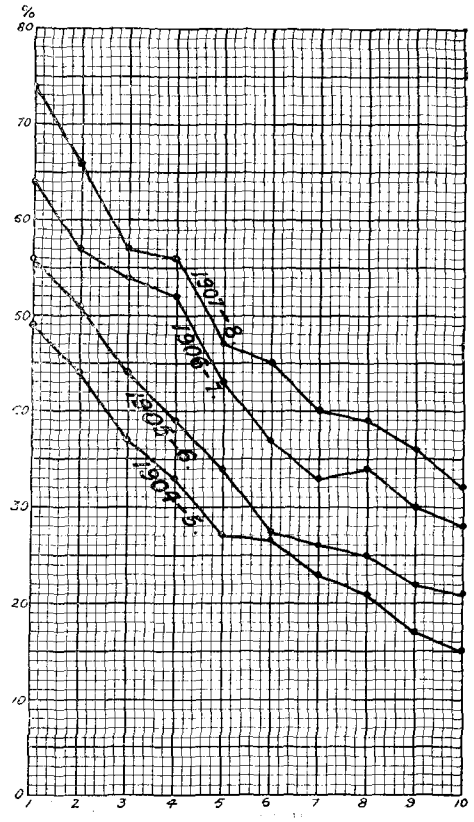
Number of Members.—The number of members of the classes has remained practically stationary, the total for the session being 3,034 as against 3,027 in the session 1906-7.

The membership in the various Courses has varied as follows in comparison with the previous session:—

	Increase.	Decrease.
Course "A"	·06 per cent.	—
" "B"	—	10·5 per cent.
" "C"	44·1 per cent.	—
" "D"	—	44·9 per cent.
" "M"	15·8 per cent.	—
" "N"	12·9 per cent.	—

Certificates.—The number of certificates being issued this session is 860. This compares with 645 for the previous session, an increase of 220 or 33·2 per cent. This increase in the percentage of members qualifying is distinctly satisfactory and, as shown in Section H of Schedule F, has taken place in every Course of the classes.

Number of Answer Papers Received.—This, as before, has fallen off considerably during the session, but it is most satisfactory to



note that (as shown by curve) there is a steady improvement in this respect.

Percentage of Marks obtained.—The percentage of marks obtained shows a distinct improvement on those gained for previous sessions.

Member with Best Results.—W. GOULDEN (lately transferred from the Brighton district to the Engineer-in-Chief's staff) occupies the premier position, having obtained the following percentages of marks):—

In the "B" Course ... 100 per cent.
" "C" " ... 96·9 "
" "D" " ... 98·4 "

MR. W. GOULDEN.

Operators belonging to Classes.—There has been again a considerable number of the operating staff joining the classes, several of whom have gained certificates.

Miss F. M. DYER and Miss A. STONE, both of Portsmouth, are worthy of special mention, each having obtained 100 per cent. marks in the "M" Course, and being the only members of that Course to do so.

MISS F. M. DYER.

MISS A. STONE.

Next Session.—The session 1908-9 is due to commence in September next, probably on the 21st of the month.

First five places obtained by members in each of the various Courses—

				Percentage.
"A" COURSE.				
1st place	Cornell, W.	Birmingham		99·0
2nd "	Kennedy, J. W. M.	Glasgow		96·9
3rd "	Critchlow, V.	Bristol		95·8
	McCambridge E.	Manchester		
4th "	Carroll, H. B.	Liverpool		95·3
5th "	Crowley, H.	Liverpool		94·8
"B" COURSE.				
1st place	Bennett, S. Y.	Bristol		100·0
	Goulden W.	Brighton		
2nd "	Parry, J.	Liverpool		99·0
3rd "	Hague, E. L.	Leicester		98·5
4th "	Grindrod, A. H.	Sheffield		96·4
5th "	Bastow, F.	Bradford		95·9
	Shipton, E.	Met. Electns. Dept.		
"C" COURSE.				
1st place	Goulden, W.	Brighton		96·9
2nd "	Hague, E. L.	Leicester		94·6
3rd "	Herink, H. J.	Norwich		92·7
4th "	Rae, R. B.	Edinburgh		92·3
5th "	Mayman, A. C.	Hull		91·5
"D" COURSE.				
1st place	Warnock, J. W.	Glasgow		99·2
2nd "	Goulden, W.	Brighton		98·4
	Hague, E. L.	Leicester		
	Pettigrew, T.	Glasgow		
	Price, L.	Leicester		
3rd "	Harrison, R.	Birkenhead		96·0
	Sutherland, A. E.	Birkenhead		
4th "	Locke, J.	Manchester		94·4
	Munro, D.	Preston		
5th "	Harris, W.C.	Plymouth		93·6
"M" COURSE (two places only).				
1st place	Dyer, Miss F. M.	Portsmouth		100·0
	Stone, Miss A.	Portsmouth		
2nd "	Brown, G.	Glasgow		99·5
	Critchlow, V.	Bristol		
	Finlay, J.	Cardiff		
	Fraser, E. J.	Edinburgh		
	Hall, F...	Bristol		
	Lindsay, H. R.	Greenock		
	McLean, M.	Glasgow		
	Morice, L. F.	Bristol		
	Pattison, C.	Glasgow		
	Sutter, A.	Glasgow		
"N" COURSE.				
1st place	Burt, J. E. G.	Bristol		100·0
	Kennedy, J. W. M.	Glasgow		
	Scott, J. F.	Glasgow		
2nd "	Hutchison, J.	Glasgow		99·1
3rd "	Duncan, A. S.	Glasgow		98·6
	Morice, L. F.	Bristol		
	Pearson, S. G.	Manchester		
	Smart, E. W.	Gloucester		
	Watt, A. M.	Glasgow		
4th "	Herink, H. J.	Norwich		98·2
	Honick, H. A.	Nottingham Factory		
	McLean, A.	Glasgow		
5th "	Edward, G.	Glasgow		97·7
	Kynaston, F.	Liverpool		
	Mason, H.	Portsmouth		
	Miller, G. W.	Glasgow		

AN UNDERGROUND EXCHANGE.

THE initial trial of the new underground automatic exchange recently installed at North Columbus, Ohio, by the Columbus Citizens' Telephone Company, was successful beyond expectation.

This is the first automatic underground exchange ever attempted in the United States. The vault in which the exchange is buried is made of concrete and the interior is fitted with 100 switches.

If the new underground exchange works as is expected and as successfully in years to come as at the time it was first buried, it will mean a great advantage over the present office installation system, in that it will save high office rent.—*Telephony.*

A PARISIAN TELEPHONE PLAINT.

A PARIS daily paper, in concluding a popular article on recent experiments in wireless telephony, remarks as follows:—These results in wireless telephony appeal forcibly to the imagination. Would that they gave promise to us unhappy Parisians of the approach of an era of sweetness, when the present exasperating eccentricities of the telephone service will vanish! But for us the singing arc warbles no phrase of hope; whether telephony be wireless or with wires, the torture of awaiting in vain the completion of a call which is never completed will always be with us!

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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MICROBES AND MICROPHONES.

ONE of the cheerful missions of the medical press seems to be periodically to scare the lay public with some horrid picture of disease germs lurking in familiar places, ready to pounce on the unsuspecting wayfarer and undermine his strength by propagating within his complicated system some one of the mysterious ills which flesh is heir to. Fortunately, the great mass of matter in the medical journals is expressed in such highly technical language that it can only be understood by the initiated; otherwise, with the hundreds of people afflicted with the *cacoethes scribendi* whom the sensational press keeps in a constant state of sensitive activity, not a week would pass without a ten-million-throated shriek of alarm being raised on the dangers which threaten the human being from within or from without. For our part, even with a very slight knowledge of anatomical technicalities and medical slang, we never skim through a number of the *Lancet* or the *British Medical* without a feeling of wonder that any of us reach maturity, or, having got there, are able to eat three meals a day and do our daily work.

When, however, the *Lancet* provides such simple material as a few telephone mouthpieces, a few "swabs" and a couple of guinea-pigs, then all is plain sailing, and the appearance of a scare heading, "The Deadly Telephone," in nine-tenths of the daily papers throughout the country is to be looked for as confidently as the weather report. But microbes and bacilli are a distasteful subject of discussion and the scare soon subsides, without producing even a momentary check in the steady growth of the telephone service. The truth is, as several of the more serious daily journals have pointed out, that microbes and bacilli are everywhere, like the ether. We do not breathe a chemically pure atmosphere, we do not wear chemically pure clothes, or handle chemically pure articles of any sort—and the imagination of the reader will readily suggest things which we daily use much more intimately than anyone uses a telephone transmitter—neither do we eat chemically pure food nor drink chemically pure drinks, and if we did we should not like them. We are constantly inhaling and absorbing and imbibing microbes and bacilli, but happily for us our powers of resistance are great, and our internal economy is capable not merely of resisting the invaders but of destroying them.

That a telephone mouthpiece should be kept clean goes without saying: ordinary sense of decency and comfort demands that. That when frequently used by a number of different people it should have a special cleansing treatment is not an unwise precaution, and one easily practised. But that the telephone transmitter should be sensationally paraded as a disease-spreading machine is the height of absurdity. An article in *The Times* points out that during the period which has seen such a great growth in the use of the telephone there has been a marked diminution in the death rate in Britain from tuberculosis. As the telephone is used in Britain about 3,000,000 times daily, this fact is incompatible with the sensational view that the telephone has any material part in spreading disease. One might make many unpleasant suggestions of the possible application of "swabs" and guinea-pigs to articles in daily use by all of us which would doubtless yield much more "microbious" results than the transmitter mouthpiece, but we have no desire to start a counter-scare which might prevent many timid people from again travelling in a railway carriage, cab, omnibus or tram, eating another meal in a restaurant or drinking one more friendly glass at the bar—or even at the club.

FRENCH TELEPHONY.

THE French Parliament adjourned for its summer holidays last month without advancing another stage towards solution of the extremely difficult "telephone question" which so much vexes our neighbours across the Channel. Press agitation, meetings of protest, petitions to return the telephone system from State control to private enterprise, strongly expressed public demands that active steps should be taken to remedy the ineffective telephone service under which Paris and France suffer daily tortures, have all beaten harmlessly on the rocks of legislative apathy. The French deputies and senators have annexed a great railway system to the State machine, shelved the income tax, and gone on their way rejoicing.

The telephone service remains *in statu quo ante*, and that state is about as bad as it can possibly be, if we may believe the numerous reports and publications in which the history of French telephony is written.

The latest of these is the report of Mr. NOULENS, reporter of the committee of the Chamber of Deputies on the budget of the French Post Office, an abstract of which has lately been published in the Paris newspapers. Mr. NOULENS, like all his predecessors in the cheerful annual duty of officially arraigning the French Post Office, points out that that department has never had an adequate conception of the requirements of the telephone service or of the development of which the service is capable. (This may be said of almost every Post Office Administration in Europe which has taken the telephone under its benevolent and somnolent protection.) In France, according to Mr. NOULENS, all branches of telephone work have been badly done or allowed to fall behind the times—plant, staff, tariff and business methods generally are unsatisfactory, and therefore the reqirements of the public are inadequately met.

On the tariff question Mr. NOULENS is very emphatic, and his remarks would bear study by some people in this country. The flat rate, he considers, has no justification whatever, and he recites the familiar arguments against charging a uniform price for widely different amounts of service. The only rational method of charging for telephone service, the report states, is by a measured rate tariff under which the charge is proportional to the use made of the service. Unfortunately, as the report indicates, the French Administration will have great difficulty in adopting a measured rate tariff in Paris, because it has not plant enough and cannot quickly provide plant enough to meet the demand for service which would immediately arise if a tariff were adopted that would bring the telephone within the reach of the many thousands of possible users who will not pay the flat rate.

The state of telephony in France is a signal instance of the many disadvantages surrounding the conduct of a technical business by a bureaucratic department. The whole organisation of plant and staff is allowed to lapse into such a state of inefficiency that it becomes impracticable to face the only effective remedy—complete reconstruction and reorganisation—because either the cost involved cannot be met or political difficulties prevent a proper solution. And the humiliating confession has to be made that modern business methods cannot be adopted because the plant and organisation of a Government Department could not cope with increased demand from the public for what is to-day practically a necessity in business and in the home. So chaos is calmly allowed to continue, the demands of the public are ignored and officialdom is left to plough its lonely and unending furrow in peace.

SHOPPING BY TELEPHONE.

IN another column we draw attention to some of the methods by which large retail stores which have installed a branch telephone system throughout their premises seek to educate the public in the use of it. As was inevitable, the private branch exchange equipment, with its telephone on every counter and its possibility of placing the customer promptly in direct communication with the department desired, conquered as soon as it came. In our monthly column "What the Company is Doing" we have referred to the gradual extension of this system to Harrod's, the Army & Navy Stores, and numerous large provincial houses of a similar character. The number increases monthly, although the movement is only at its beginning.

The *Daily Telegraph*, in a recent article headed "London-on-the-'Phone," says "Every shopkeeper must necessarily be on the 'phone if he wishes to do anything like a big business, for it is becoming more and more common for housewives to give their daily orders over the wire." This should occasion small wonder, when it is remembered that many tedious journeys—often in rainy and unpleasant weather—can be avoided, and much useful time saved, by giving an order over the telephone. The more enterprising firms make special arrangements to deal promptly and efficiently with orders received over the wire. Gone, or going, are the days when a telephoned message was received by some inexperienced junior, apathetic as to the customer's requirements, and apparently hard of hearing; by the modern way the would-be purchaser is connected with the salesman by whom he or she would have been served on a personal visit to the stores, and the goods are punctually despatched as a matter of course. One firm, indeed, is arranging to ring up for orders at regular intervals in a systematic manner corresponding to the tradesman's daily call. We are not disposed to speculate on the days when shopping as we now understand it shall be a lost art, and the occupation of the pressing youth who, exhibiting some enticing novelty, demands "And the next article, please?" shall be gone. Experience shows, as we have remarked elsewhere, that new inventions do not necessarily imply the extinction of old methods; they more often supplement them. There would be a difficulty in matching colours by telephone, which would also arise in all cases where questions of taste or choice came into consideration. No doubt all-conquering science will remove some of these, but the fact remains that the growing habit of shopping by telephone is destined to revolutionise retail business methods.

PORTRAITS.

REPRODUCTIONS on plate-sunk art cards of the photographs of Messrs. T. A. PROUT and V. ALSOP which have appeared in the JOURNAL are now ready, price 6*d*. each. Those of Messrs. A. E. COTTERELL and W. W. COOK are on order. Portraits of all "Telephone Men" whose photographs have been reproduced are in stock.

HIC ET UBIQUE.

THE *Zeitschrift für Schwachstromtechnik*, referring to Miss BOYLAN'S article in last month's JOURNAL, says that it "shows the qualities of operators which assure the greatest success and the manifold complaints of subscribers which prejudice such success. The wise and pertinent observations offer a good example of the high importance of an intelligent and discriminating staff of operators."

THE daily Press quotes a telegram from St. Petersburg announcing that experiments have been made in the utilisation of railway lines as telephone conductors for long distance speaking. Successful results were obtained on the St. Petersburgh-Pekoff line, and voices were clearly heard over a distance of 310 miles. Detailed particulars are not to hand.

CERTAIN papers have published a "Batch of Telephone Stories" from the NATIONAL TELEPHONE JOURNAL, which they say are not only humorous but strictly true as well. We are obliged for the first qualification; while as regards the second those stories which are given in the JOURNAL as true are undoubtedly true. Unfortunately, however, some editorial hand has thought it necessary to mix stories from obvious American sources with the true ones, and has gone to the length of inserting "Gerrard" and "King's Cross" in one of them "to give an air of verisimilitude to an otherwise bald and unconvincing narrative!"

THE *Labour Leader* need not be alarmed for the fate of the telephone girl because a small automatic exchange is to be tried at Lyons. Automatic exchanges are also on trial at Vienna and other places and have been established for some time in small towns in America, but there is no disposition on the part of telephone administrations to dispense with their operating staffs. "Every man his own operator" is not a war cry which will appeal to the average subscriber; the drawbacks are too obvious.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

THE following grants were made during June:—

	£	s.	d
Maintenance Department	2	0	0
Engineers' ,, ...	2	5	0
Traffic ,, ...	3	10	3
Workshops	1	0	0

Total number of grants now made, 90. Amount paid in grants, £243 4s. 9
Number of members at June 30, 2,872.

THE NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION.

THE SELECT COMMITTEE ON POST OFFICE (TELEPHONE) AGREEMENT, 1905.

BY W. R. BOLD.

ON Feb. 2, 1905, the then POSTMASTER-GENERAL (Lord Stanley) entered into an Agreement with the National Telephone Company providing for the transfer to the POSTMASTER-GENERAL on Dec. 31, 1911, of the whole plant of the Company.

The only clause in that Agreement which referred to the Company's staff was Clause 8, which provided that the POSTMASTER-GENERAL should have an absolutely free hand not only as to what members of the staff he should take over, but also as to what salaries and positions he should offer them. The staff was confronted with a prospect so disquieting that, on the terms of the Agreement becoming known, the National Telephone Staff Transfer Association was immediately formed to protect the interests of the staff on transfer.

The Agreement provided (*inter alia*) that it should become binding when confirmed by a Resolution of the House of Commons or on Aug. 31, 1905, if not disapproved by Parliament before that date.

On May 3, 1905, Lord STANLEY in the House of Commons moved the question "That a Select Committee be appointed to consider the Agreement of Feb. 2, 1905, between the POSTMASTER-GENERAL and the National Telephone Company, and to report whether it is desirable in the public interest that the Agreement should become binding."

The debate on the question was adjourned until May 22, 1905, when, owing to representations made to him by various members of Parliament, and in particular Mr. CORRIE GRANT (Rugby), on the association's behalf, Lord STANLEY accepted, among other amendments, an amendment to add the words "and also whether the interests of the employees of the National Telephone Company have been duly considered."

The question having been agreed to—Mr. (now Sir JOHN) BENN, Lord BINGHAM, Sir HORATIO DAVIES, Mr. KEIR HARDIE, Mr. HELME, Sir WILLIAM HOLLAND, Mr. LAMBTON, Mr. MORRISON, Mr. JOSEPH NOLAN, Sir CHARLES RENSHAW, Colonel ROYDS and Mr. STUART WORTLEY were nominated members of the Committee.

The Committee sat for the first time on May 25, 1905, with Mr. STUART WORTLEY as chairman, but it was not until July 10, 1905, that the question of how the Agreement affected the staff was reached.

Mr. DALZELL (the then chairman of the association) was the first witness to give evidence on behalf of the staff. He explained the staff's objections to Clause 8 of the Agreement to be—

(*a*) That it did not give any guarantee of continuity of employment.

(*b*) That members of the staff might be called upon to accept less salary than that received from the Company or to perform duties of a different character.

(*c*) That it did not guarantee that members of the staff taken over would be placed on the permanent Civil Service of the State.

(*d*) That the staff would lose the benefit of its past services, and

(*e*) That the members of the staff not taken over would have no claim under the Agreement for compensation.

Speaking broadly, he claimed continuity of service for all members of the staff employed by the Company at the date of transfer, with the benefit of their past services and superannuation allowances for all those in receipt of a salary of £100 or upwards, or who occupied a post or office which, if occupied in the service of the State, would entitle him or her to a superannuation allowance or in the alternative adequate compensation for loss of office.

Mr. ALSOP also gave evidence on behalf of the association, supporting the staff's objections and claims by dealing in detail with the precedents I quoted in my article on "The Staff's Case for Recognition of Past Services," and submitting a draft clause, which had been drawn on the lines of Sections 40 and 47 of the Metropolis Water Act of 1902, so as to put the staff's claim in a concrete form before the Committee.

The evidence of the association's witnesses was taken on July 10 and 11, 1905, and on July 17 Sir HENRY (then Mr.) BABINGTON SMITH, Secretary to the Post Office, replied thereto on behalf of the POSTMASTER-GENERAL. I have already dealt with what appears to be the principle underlying Mr. BABINGTON SMITH'S arguments against recognition of the past services of the staff and hope to deal with other of his arguments in a future article, but think it best to mention that he laid great stress on the fact that the members of the staff were subject to be dismissed on notices varying from a week to a month, inasmuch as that fact appears to have formed an important factor with the Committee in making their recommendations, as they specially refer to the same in their report.

Personally I cannot see why so much, or any, stress should be laid on the fact that members of the Company's staff are subject to dismissal on short notice. Surely the same factor exists in the case of any staff employed by a public company. Did it not exist as regards the staffs of the various telegraph and water companies, and does it not exist with regard to the staffs of the dock companies, yet the point does not appear to have been raised as regards those staffs, or if it was it has not in any way prevented them from securing the equitable treatment the Company's staff is asking for.

Another fact which was pressed by Mr. BABINGTON SMITH and made the subject of special reference in the Committee's report was the expiration of the Company's license on Dec. 31, 1911.

In my previous article I have attempted to show that apart from the Agreement of Feb. 2, 1905, it is fallacious to state that the Company's power to carry on business would have expired on Dec. 31, 1911, but, apart from that, how many members of the staff when taking service with the Company were aware that it was working under a licence which expired at the end of 1911?

The ordinary person on entering the service would say to himself, "The telephone business is a special and thriving business with a big future before it. So long as the business exists, which must be for ever, and I satisfactorily perform my duties I am sure of employment, with good chances of promotion." Even supposing that he was aware that the right to carry on the business would revert to the POSTMASTER-GENERAL in 1912 he would have had no fear for his future, seeing that the principles underlying the transfer of staffs to the POSTMASTER-GENERAL and public authorities on the cessation of licenses or the purchase of undertakings have been so often and so definitely settled.

The association, in accordance with the usual practice, applied to the Post Office officials for a copy of the evidence proposed to be given on behalf of the POSTMASTER-GENERAL in relation to the staff, but were unable to obtain the same, and, moreover, the Committee, owing to the shortness of the time at their disposal, were unable to hear the association's witnesses in reply to the Post Office evidence, so that the association had to be content to reply by means of a short written statement which had to be in the hands of the Committee within 24 hours.

The Committee's report was published on July 31, 1905, and so far as it related to the staff was to the effect that all officers and servants who should have been not less than two years continuously in the service of the Company on Dec. 31, 1911, should as from that date become officers and servants of the POSTMASTER-GENERAL, and that such of the said officers and servants as were not beneficiaries of the Company's pension scheme, and who, if in the service of the POSTMASTER-GENERAL would be on the established list, should be entitled to count two years' past services as service under the Crown.

They further recommended that no member of the Company's staff should suffer loss by reason of the transfer, and that none of the then members of the staff should be required to submit themselves to medical examination.

In considering the Committee's report it must be carefully borne in mind that they interpreted the part of the reference to them which related to the staff "as meaning that we should inquire whether those employees will, if the Agreement becomes binding, be thereby placed in a substantially worse position than that which they occupied on Feb. 2, 1905," and further that they finish their report by stating: "Having regard to what we have recommended and assuming that those recommendations are carried out we do not think that the coming into operation of the Agreement will place

the staff in any worse position than that which they stood on Feb. 2, 1905."

It will be seen that, although the Committee, for some reason not apparent to me, interpreted the direction to enquire whether the interests of the staff had been duly considered as being equivalent to a direction to see that the staff were not placed in a substantially worse position than that which they occupied on Feb. 2, 1905, the recommendations made by the Committee practically met the staff's claim in all particulars save the question of the full recognition of the staff's past services.

In refusing to allow the staff the full benefit of its past services, did the Committee carry out even the limited interpretation given by them to the terms of reference?

I have endeavoured to show that the universal practice and custom of Parliament and the POSTMASTER-GENERAL in the past have been to grant the benefit of its past services to each staff taken over, whether such taking over has been the result of the Legislature stepping in, voluntary agreement, or the termination of a lease or license.

Surely by ignoring or waiving the staff's reasonable expectations, which are based on a custom firmly established, the Committee's recommendations, even if adopted and acted on in a liberal spirit, would place the staff in a substantially worse position, seeing that they would lose the benefit of the custom without compensation.

Further, assuming that the Committee's recommendations were acted on and the ordinary Civil Service rule of promotion by seniority was adhered to, the Company's staff on transfer, by losing the benefit of its past services, might be very severely penalised by promotion being given to existing members of the Civil Service on the ground that their service with the State was longer, although their knowledge of telephone work was less.

TELEPHONE WOMEN.

XXI.—PHYLLIS EADES.

MISS E. PHYLLIS EADES, Clerk-in-Charge of the Central Exchange, Birmingham, entered the Company's service on Aug. 8, 1887. At that time the exchange was situated at Bennetts Hill, and consisted of about 190 lines served by four operators. The board was known as the Blake-Emmott, with four 52-line sections, slipper pattern jacks, fixed transmitters and receivers. The room was very small, and had to do duty for switchroom, dining and cloak room combined. There also existed four sub-exchanges, viz, Jewellers, Aston, Smethwick and Moseley.

During May, 1888, Miss EADES saw the change over to the first multiple switchboard in Birmingham, consisting of three 200-line sections. At this period the only apparatus to deal with trunk working was two wall instruments fitted on rough boards with separate jacks in a box below the instruments. Later a small board was erected, and afterwards a room was set apart for trunk working. About the end of 1890 headgear receivers were introduced.

Miss EADES was appointed Clerk-in-Charge in July, 1894, and has vivid recollections of the change from Bennetts Hill to the present exchange at Newhall Street which took place in November, 1897.

Miss EADES has served under four district and five local managers since her appointment as Clerk-in-Charge, and is at present working under the direction of a traffic manager. Her duties as Clerk-in-Charge up to a recent period were many and varied, she having to act as paymaster, see to works orders, keep directories and check proofs and advertisements.

Miss EADES has seen the introduction of a common battery board into Birmingham, an extension having been made to the Central Exchange for 2,100 lines, the board being successfully opened in June, 1907. As an instance of the growth of the telephone service it was found necessary about three years ago to open up more branch exchanges (making 25 in the area), thus relieving the Central of a number of subscribers. Notwithstanding, there are over 5,000 subscribers on the exchange with a staff of 160.

During the number of years Miss EADES has been in charge of the Central she has always shown herself to be kindly and courteous to the members of the staff, and many have kindly recollections of her care and interest in their work. Miss EADES pleads guilty to

PHYLLIS EADES.

the simple telephone life, and therefore has very little time for hobbies. She, however, is very fond of reading and indulges, when time will allow, in fancy cooking.

XXII.—EDITH J. WILLIAMS.

MISS EDITH J. WILLIAMS joined the Company's service in February, 1889, entering Birmingham Central at Bennetts Hill, Birmingham, and in the August of the same year was chosen to operate for three months a switchboard at the Electrical Exhibition held at Bingley Hall.

EDITH J. WILLIAMS.

In 1890 Miss WILLIAMS' family removed to London, and in consequence she was transferred to the Queen Victoria Street Exchange (now known as Bank) under the control of Miss RALPH, and subsequently transferred to the Avenue Exchange, which was then situated in East India Avenue.

During July, 1892, Miss WILLIAMS returned to Birmingham and was reinstated at the Central. In December, 1894, she was appointed Assistant Clerk-in-Charge at the Central Exchange, and among her many duties she had to visit the absentees, teach operators and interview prospective candidates for the position of telephone operator.

In April, 1907, Miss WILLIAMS was made Clerk-in-Charge of the seven branch exchanges and visiting clerk-in-charge of the sub-exchanges in the outer district.

Miss WILLIAMS is quiet, resourceful and tactful, and during her years of service has made many friends among the staff. She is keen to uphold the standard of work in her exchanges and by her capability has rendered good service, as is shown by the improvement in those exchanges for which she is responsible.

Miss WILLIAMS has no special hobby, but is fond of singing and is also an adept at gardening.

NOTE.—It is regretted that the portraits of Miss ALMA and Miss ELTA FLUX published in last month's JOURNAL were transposed. That appearing in the biographical note of Miss A. M. FLUX is Miss E. M. FLUX, and *vice versa*.

SHOPPING BY TELEPHONE.

HOW LARGE PRIVATE BRANCH EXCHANGE SUBSCRIBERS ADVERTISE THEIR FACILITIES.

THAT the advantages of the private branch exchange system are realised to the full by the large stores and kindred establishments is evidenced by the varied and original leaflets and advertisements which district managers in different parts of the country send us from time to time.

Mr. D. M. BROWN, of Dundee, issues a folder with the title "Shop by 'Phone. Call 722."

The new intercommunication telephone system installed throughout the warehouse is still one more modern help to greater convenience in shopping.

You need only ring up No. 722—the one number serves for all the system. When central puts you in connection, in a few seconds you can be talking to an attendant in any part of the building. There is no weary waiting till a message finds its proper recipient or till someone has hurried over two or three floors and up or down three or four stairs. The connection is made on the private switch and you don't lose a minute.

For example, suppose you wanted to enquire about a suitable lace for some purpose or other. You would ring up 722 at the central first. On getting response from the clerk in charge of the telephone room here you would be switched on to the telephone in the lace section. You could then make your enquiries and give your order, the same as if you were at the counter. Indeed, you would practically be at the counter.

In the same way you can communicate with any other sales department in the store; with the office; with the delivery section; or with a friend who may be in the tea room and expects you to 'phone your message.

Then, too, this new departure brings the telephone, one of the greatest commercial ideas of to-day, more generally into the service of the public. At any time from nine morning till eight evening you can enter the store and use any of the instruments throughout the house to send a private message, paying the National Telephone Company's regular charge, one penny per call, into the receiving box beside the instrument.

Altogether there are 21 instruments throughout the warehouse, and any one is at your service.

Get used to using the telephone. Get used to using No. 722.

The Liverpool *Bon Marché* has a leaflet illustrated by a sketch map showing the telephone junction lines radiating from Liverpool to the principal surrounding towns, and containing the following information:—

LONG-DISTANCE SHOPPING BY TELEPHONE.

TO SAVE TIME IS TO LENGTHEN LIFE.

"*I'll put a girdle round the earth in thirty minutes.*"

—MIDSUMMER NIGHT'S DREAM.

The *Bon Marché* don't want to do that, but they have put every lady in the land into direct telephonic communication with the expert buyer of each of their 40 departments, thus ensuring a direct personal service, and bringing trained advice on articles of wear to the fireside. There is no crushing, no crowding and no waiting. Immediate attention and prompt despatch. Five trunk lines, one exchange and 40 branches throughout the establishment. They are all at your service. 'Phone the *Bon Marché*, Liverpool, and save train fares, time and worry. Ring up 2080 Royal, and ask for department required.—The *Bon Marché*, Liverpool.

The Army & Navy Stores, London, issue the following circular to their subscribers, from which it will be seen that ringing up to solicit orders by telephone is likely to take the place in the future of the tradesman's daily call for orders:—

TELEPHONE FACILITIES.

The number of members on the telephone having very largely increased, arrangements have been made to instal a new and thoroughly up-to-date system (used very largely indeed in America but not hitherto in England) to meet their convenience.

The construction work to be done will be considerable, but it is hoped that the new arrangements will be in working order before very long. Members will then be able to give their orders from their homes without trouble or delay, and will, if necessary, be able to speak to the particular assistant who knows their requirements.

It will also be possible for them when visiting the stores to communicate with their friends from any part of the building.

When the system is in force, arrangements will be made to ring up at daily or longer intervals as desired the houses of those members who wish to give regular orders for supplies by telephone.

Lastly may be mentioned a Cheltenham firm of jewellers (Waite & Son) who, although not private branch exchange subscribers, have issued a circular informing clients that they are now telephone subscribers, and can be rung up for correct Greenwich time.

These and many other such indications show the large part which the telephone is destined to play in domestic economy in the immediate future.

MEASURED RATES AND TRAFFIC.

BY E. J. JOHNSON, *Sheffield*.

THE introduction of the measured rate service has necessitated considerable alteration in operating methods. The first effect is a reduction in the calls per subscriber, and consequently an increase in the number of lines which can be taken by an operator. The reduction of calls per subscriber reduces the operator's load as regards answering, but the work per call is increased by the recording, so that the increase in lines is not proportional to the reduction in calls.

A possible effect of this service is to flatten the daily load line, and thus make it possible to arrange the operator's duties more economically than can be done with the present flat rate.

The measured rates have not been in force long enough and the traffic has not been great enough to enable the effects to be stated definitely or the operator's load to be standardised. The remarks to follow are the results of observations on the Sheffield measured rate traffic, and must not be taken as being of general application or as final, but only as an indication of what is taking place and of probable future developments.

In working the measured rate service records have to be made by the operator of each call in order to ascertain (1) that the number of calls contracted for is not exceeded, (2) that any excess calls are duly charged for at the excess calls' rate, and (3) that proper junction fee charges are made.

With this class of service the exchanges are divided into two classes, "grouped" and "ungrouped." For the grouped exchanges the charge is the same as for calls on the originating exchange, for the ungrouped an additional penny is charged.

The calls made on magneto exchanges are recorded on tickets, on central battery exchanges by registers and tickets. On central battery exchanges tickets are used for party line calls, junction calls on which a junction fee is charged, and as memoranda for the completion of ineffective calls and for crediting subscribers with free calls which have been registered against them or with any calls registered in error. In this paper we will confine our attention to magneto exchanges.

The tickets used are made up in blocks of 200 and measure 3 inches by 2 inches; for large exchanges they are not numbered, for sub-exchanges where the caretaker is responsible for the operating they are numbered.

In order that the operator shall be able to write the necessary particulars on the ticket with her right hand while she is operating with her left, a special clip is provided on each position, which clips the cardboard backing of the block of tickets, and holds it firmly to the plug shelf. A receptacle is required for the tickets, this is made of aluminium and screwed is to the plug shelf on the right-hand side of the plugs and cords, close to the jack panels. These receptacles are very small; the reason for this is to ensure that they are cleared at frequent intervals. This necessitates a visit from the supervisor, who while clearing the receptacles will also see that the operators are supplied with tickets and that the operating is proceeding satisfactorily.

When tickets are removed from the receptacles on the various positions they must be kept in order, each position's tickets being placed together. To enable this to be done a box has been made with six divisions, each division numbered with the position number. When tickets are cleared from the various positions during the day they are put in the corresponding division of the box. At 6 p.m. all positions are cleared of tickets and the box locked up for the night.

The tickets are sent to the district office daily; before being sent the tickets for each position are counted and put in a wrapper on which is written the name of the exchange, the position number and the number of tickets. The tickets are then placed in a leather bag which is locked by the clerk-in-charge, who retains the key, and forwarded to the district office where it is opened by means of a duplicate key, the tickets extracted and the bag returned to the switchroom. The tickets are sorted by the district office clerks and the particulars as to the number of local and junction calls entered against the subscriber. In the sorting all the cancelled, service call and Post Office tickets are thrown out, as no charge is made for cancelled or service calls, and the local fee for trunk speaking is charged from the trunk account.

On the measured rate, so far as operating is concerned, there are three classes of service: (1) Measured rate with automatic box, (2) measured rate without automatic box, and (3) private residence with unlimited local service, but liable to a charge for all ungrouped junction calls. In the exchange these are distinguished by the calling indicators being painted different colours. The colours chosen are green, red, and brown. Green signifies, make out a ticket for each call; red, ask for a penny; brown, make out a ticket for all ungrouped junction calls.

From this it will be at once understood that a green indicator signifies to the operator that the subscriber is a measured rate subscriber, and that a ticket has to be made out for each call, and that in the case of calls to ungrouped exchanges, which are distinguished by the junction number strip being painted red, the junction code is to be added. A green and red indicator signifies that a ticket has to be made out as for green indicators and that one penny is to be put in the automatic box for all calls to grouped exchanges, and two pennies for all calls to ungrouped exchanges.

The brown indicators signify that the subscriber has unlimited calls to grouped exchanges, but is charged for all calls to ungrouped exchanges. Tickets are not made out for the grouped exchange calls, but for the ungrouped only.

The time taken to operate each class of call is different, and before it is ascertained it is not possible to say what the value of each call is, in terms of flat rate calls, and therefore to ascertain the corresponding load for an operator.

As this service is of such recent origin there has not been any standard fixed for the number of calls an operator should answer in a given time or of the number of lines she should control.

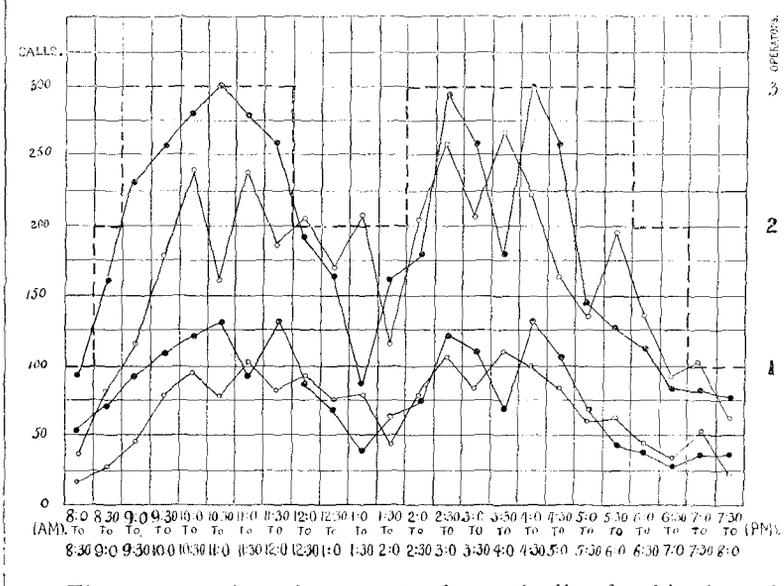
Before going on to the consideration of this most important point, let us see in what respect measured rate operating differs from flat rate operating. In measured rate operating there are three additional movements: (1) Write out ticket, (2) tear it off the pad, (3) place ticket in holder. This is not all, for if the wanted line is engaged the operator must make out a ticket and after saying "Number engaged," add "Shall I call you?" If the answer is "Yes," the necessary particulars are to be entered on the ticket and the call completed as soon as possible. This takes time and has to be allowed for when determining the operator's load.

The time taken to operate each class of call is very different, and before this is ascertained it is not possible to say what the value of each call is in terms of flat rate local calls, and therefore to ascertain the correct load for an operator. If a flat rate operator answers 200 calls per hour, 18 seconds is allowed per call, including time for clearing. From 110 tests made 8·3 or, say, 9 seconds is taken by the operator to deal with a local call from the moment of plugging in to going out of circuit, thus allowing a period of 9 seconds for clearing, etc.

The length of time taken to operate a measured rate call, from 107 observations, is 10·5, or, say, 11 seconds; valuing all work in proportion to the time occupied it works out in round figures to 160 calls per hour. From this it is seen that the measured rate operator's load should not exceed 160 calls per hour, when not making any allowance for making engaged calls effective. Allowing for this the measured rate operator's load should be about 140 calls per hour, this gives a valuation figure of 1·43 per call, or, say, 1·5, to give a safe figure and to ensure that the operator shall neither be too busy to make out all tickets nor be unable to give a good service, and to ensure also that there should be overload capacity.

It is important that the operator's standard load shall be such that at times of pressure it may be exceeded, or, in other words, that there shall be some overload capacity. The present flat rate standard is of this nature and is frequently exceeded when occasion arises.

We now come to calls on lines fitted with automatic boxes. The operation of calls on these lines takes up much more time than purely measured rate operating, as not only has the operator to make out tickets, but she has to get the wanted subscriber before asking for the penny and then to wait the caller's pleasure in putting it in. This is not, however, such a long business as might be expected, averaging 30 seconds on calls on which no trouble is experienced, the caller taking about 2·4 seconds in putting the penny in the automatic box. There are cases every now and then which take up much more time; this frequently happens with people who use the box for the first time. From the observation of 47 calls the percentage of delays caused by ignorant or improper use of the box works out at 4·7 per cent. The number of observations is perhaps hardly sufficient to accept this as a safe figure.



The average time the operator is on the line for this class of call is 28·4 seconds, not making any allowance for difficulties. An allowance for plugging in and making out the ticket increases this to 30 seconds per call.

As the operation of a measured rate automatic box call takes 30 seconds without making any allowance for difficulties, due to the callers not putting the penny in, using bent coins, wanting a twopenny call for a penny because he has not sufficient change, or other cause, we must get a value for it in terms of flat rate calls. A simple proportion sum gives the number of calls as 60, this values the call at 3·3 local calls. Giving a value of 4 will allow for difficulties and will also give considerable overload capacity.

To enable the measured rate traffic to be treated on the same lines as flat rate traffic each class of call must be valued as I have already described. It will make the meaning clear if the values are tabulated. They are: Flat rate local, 1; measured rate local, 1·5; measured rate automatic box, 4. If any of the above involve the use of a junction line add 1 to every such call, to allow for the additional time taken in getting the distant exchange.

To show how the valuation affects the load line the above curves have been prepared representing the calls on two different days.

The two lower curves represent unvalued calls, the two upper curves represent the same calls valued as previously described.

The open circle curves representing the valued and unvalued calls for one day and the filled circle curves the calls for the other day.

This section of 300 indicators is not yet quite filled up with working lines, but will eventually be filled. It is also unfavourably situated for team working from neighbouring sections, the operators cannot therefore take such a heavy load as would be possible under more favourable conditions.

These valuations must not be taken as final, further experience with a larger number of subscribers may give slightly different results. Amongst the Sheffield measured rate subscribers there are several private branch exchanges which are heavy users, and there is also a large proportion of automatic boxes. These will most probably give results which are different from those obtained from the average user and in other exchanges.

The improvements in the service due to the measured rate is effected by the decrease in "frivolous calls," or calls made on a flat rate line which are not necessary in the subscriber's judgment, and would not be made if they had to be paid for.

The measured rate subscriber, knowing that he has to pay for each individual call, is more careful of the number of times he rings up than is a flat rate subscriber. This is of benefit to the individual subscriber as well as to the service as a whole, the subscriber's line not being so frequently engaged.

Ineffective calls are when possible made effective. This is a great advantage, as not only does it prevent the subscriber making repeated calls for the same number, but it ensures that the required connection is much more quickly obtained.

The percentage of ineffective calls for the whole exchange is about 20. For measured rate subscribers only it is 2·26.

The average number of calls made per line is fifteen; per measured rate, excluding the large private branch exchanges and automatic box lines, it is four. This figure is obtained from a two days' record of calls on a position fitted with 45 lines, the majority of which are small users.

The number of calls per day, counting all users large and small, is between five and six.

These figures show a marked difference from the flat rate figures, and it is evident that a much better service can be given under these conditions than when the lines are overloaded with traffic.

THE WILLING WORKER.*

BY MARY HADLEY, *Supervisor, Birmingham Central Exchange.*

THE subject of this paper could no doubt be defined in a very few words, but for the present purpose I propose to enlarge upon the subject to some extent and deal with it to the best of my ability—from my own personal experience and observations—in all its bearing as affecting all grades generally and more particularly the employees of the National Telephone Company.

I will first endeavour to outline to you my impressions as to what the term "willing" is meant to imply. It is that feeling which enables us to overcome circumstances which present difficulties, or do not appear pleasant; and having accomplished a certain task or performed a particular duty we feel as it were on good terms with ourselves and everybody about us, there is no feeling of unrest which would cause our conscience to prick us.

Of course to be willing at all times is not an easy matter; but like all other habits, whether good or bad, if we continually practice it will grow upon us with results eminently satisfactory to everyone.

As regards a "worker," I do not intend to deal with this separately, but to now plunge into the subject and to give you a brief sketch of what a willing worker is, and the necessary qualifications and accomplishments which combine to make a person entitled to be classed under this heading. Above everything else it is necessary to be of a cheerful disposition, possessed of an even and controllable temper—the person who is unable to govern ill-temper to my mind can never be a successful candidate for the term of a willing worker—to be unselfish in all things, and lastly, but not least, not to be afraid of doing a little extra work over and above our ordinary duties. The two first qualifications are particularly essential in the trying duties of a telephone operator, whose work is not all sunshine, as most, if not all, my hearers will agree; and speaking from experience I may say there are sometimes many thunderstorms in the course of a day, but by cultivating a spirit of cheerfulness which becomes infectious to all those with whom we come in contact, work is made easier and becomes a pleasure.

A willing horse needs no whip, and the same remark applies with equal force to a man or woman in everyday life. A willing worker takes a delight and pride in attending to his or her duties, and is always anxious to follow out instructions received from superior officers; on the other hand the unwilling worker resents the well-meant advice of superiors.

Times change, and nearly all establishments find it necessary to alter their system of working as their business increases, and this has been the case with the Telephone Company within a few years. Originally an operator was placed at the switchboard, instructed which were keys, cords, and indicators, and then left more or less to the tender mercy of the next operator—in some cases the latter might be somewhat inexperienced—and I can assure you one was very thankful if one's neighbour happened to be willing to help one. The method of operating to-day is very different, and this great change has undoubtedly been a very trying time for supervisors and operators. Subscribers have had to be educated up to the present-day working, and needless to say they have not all been willing to adapt themselves to our system, although we hear of a minister who lately surprised his congregation by calling out, "Hymn number, double three, oh." I think this was a Birmingham subscriber.

To proceed, however, an operator is quick to realise how much better it is when a subscriber is willing to assist her by carrying out little details which improve the operating and curtail errors; thus if we willingly endeavour to carry out detailed instructions instead of allowing a feeling of resentment to master our better nature we shall do much to improve the efficiency of the service.

Operating differs from almost any other class of business. Take, for instance, the shop assistants; a customer enters, but seeing the assistant is busily engaged in attending to someone else he is content to wait his turn or, to use a telephone expression, "Call again later." He cannot complain, simply because he knows no business house can provide for these occasional rushes; but a telephone call must be attended to immediately, for it must be borne in mind that the subscriber does not know what is going on at the other end of the line, and in consequence does not show the same consideration for the operator. As we all know, operating is the work of the moment, not a thing to be put on one side and picked up again later, for, as pointed out by Mr. CRECRAFTY in his paper on "Observations," if only one call is not answered promptly it will show a greater average time occupied per call for the day, and as the efficiency of the whole staff is based on these figures one sees the necessity for promptitude in dealing with calls. Experience has taught us that some workers acquire a knowledge of their duties more readily than others, and I would advise these to be willing to assist in every way their less fortunate comrades. We are not all adapted for the same class of work, but by making up our minds to become master of the situation, knowledge may be easily acquired by thought, an observant mind and study of detail; thus the worker who is willing and determined to take a continued interest in her work and possesses a never failing desire as to its proper execution becomes a valuable servant of the Company and deserves every praise.

There are times when one sees the willing worker allowed to do the bulk of the work, and I have often heard unscrupulous people say, "Well, if they didn't do it, someone else would have to." This, to my mind, is a very unfair reward. Those who work simply because they have to and take no further interest can hardly be expected to work well, showing that that old proverb, "If a thing is worth doing at all it is worth doing well," is still a very true one. This also applies to operating, for if a call is not answered carefully and supervised properly numerous errors occur and subscribers are far from satisfied; on the other hand, if the operator is interested she naturally tries to satisfy the caller that she is doing everything possible to further the utility of his telephone. I do not suggest that all difficulties can be overcome,

* A paper read at a meeting of the Birmingham Operators' Telephone Society held on Feb 13, 1908.

but it is a well known saying that "Where there is a will there is a way," and it behoves us as telephone workers to find the way and never give in whatever obstacles present themselves before us, and very soon your subscriber will recognise your interest in his telephonic welfare.

There are exceptions to this rule, and some of our subscribers can only blame the operator for everything, which is very discouraging for the willing and conscientious worker. However, the subscriber with this turn of mind is to be pitied, and the operator should make an allowance for his lack of knowledge of exchange working.

Before concluding I would like to draw attention to the fact that a clever worker may sometimes be confused with a willing worker. The former may very easily be looked upon as a willing worker, probably owing to ease with which his or her duties are performed. This view, however, is not necessarily correct; the clever individual may possibly be a most unwilling worker.

The best and most capable operator or supervisor is the one who treats the work carefully and diligently, and, what is most important of all, does it willingly. Without the latter quality any cleverness is quite counterbalanced.

In conclusion my advice to each of you is at all times to endeavour to your utmost ability to help your comrades, as by so doing you will be helping yourselves and furthering the cause of making everyone a willing worker.

THE PASSING OF THE SMALL TRADESMAN.

By GEO. W. LIVERMORE, *Divisional Contract Agent, London.*

No subject has of late received more careful and serious thought than that of the ability of the smaller tradesmen to compete with the ever growing number of large stores; and the appearance of so many notices "To let" in our suburban shop windows lends colour to the assumption that the small man is passing. Yet I venture to think that competition has very little to do with it—by competition I mean competition of commerce, that of buying and selling. The small man has, I am afraid, become self-conscious and has allowed himself to be awed by the magnitude of town stores, which he imagines are founded to starve him of the local trade he has hitherto held.

Notwithstanding his grumbles, these stores have justified their existence and have merited their success, because their watchword has been progression and their aim expediency. There are evident signs of "the beam" in the eye of the small tradesman who rails at competition, yet resolutely refuses to take advantage of those very mediums which have spelled success to the stores.

There still exists, I am sure, the same sympathetic desire to shop locally as formerly, but in many cases the small man refuses to allow himself to be patronised by closing the very channel which will place him on a level with the town store. Every contract officer throughout the kingdom will know that almost the first question a prospective subscriber will ask, upon being quoted rates, is: "How many calls can I make for that?" Whilst this is, of course, important, does he ever inquire: "How many calls can I receive?" Does he consider that by subscribing to the telephone service he is opening an order office, to all intents and purposes equal to that of the store? Weather and a hundred and one things may keep the purchaser indoors; and it is infinitely quicker to ring up a store ten miles distant than to take a ten minutes' walk to a non-subscribing local tradesman.

The question of competition in prices is, I think, hardly to be considered. A good article will always secure a good profit; reliability, expedition, and above all the getatableness of the suppliers are the essential points.

There is still the same opening for the small man, but he must be up to date; he must carry on business on present-day lines.

For a young man with moderate capital and a knowledge of his trade—his most valuable asset—there is always room in the commercial world as a master man, but he must take advantage of all those means which allow him to be within immediate reach.

If the small tradesman is "passing" it is solely because his methods have "passed."

CORRESPONDENCE.

SPORTS: STAFF GATHERINGS AND THEIR INFLUENCES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

OPPOSITION and controversy are met with more or less in all phases of life, not only in business but also in recreation.

Wisdom teaches that there is a time for everything—a place for everything, and medium in all things. If we have a desire to be healthy, wealthy and wise, it is essential for these simple principles to be adopted. Discipline first and last, strict and just, must be the keynote and foundation for a business to prosper, also the grounds upon which recreations are performed, in order that they likewise may become successful. Therefore, I think if Euclid's axiom is well instilled into the mind, and so practised—viz., two halves make a whole—the man that acts accordingly will not make half a man, neither three parts of a man, but a whole man.

The letter by Mr. Parsons in the November issue of the JOURNAL, "A Protest from Brighton," reminds me of past sixteen years' service in a large manufacturing firm. The proprietor protested against sports of any description, and holidays were out of the question altogether. The office hours were from 8 a.m. to 7 p.m. The annual holidays allowed were the usual Bank Holidays, besides which the clerks had the privilege allowed them to go home twice a week to dinner, Tuesdays and Fridays, on the other days having their meals on the premises. Another chief item that engaged this wealthy manufacturer's mind, when engaging traveller, clerk, assistant, journeyman, or apprentice, was the place of worship he or she attended on Sundays, and whether a member of a Bible Class or Sunday School. During this period of sixteen years I was only laid up once with illness, and then for two months.

At this period my employer was in conversation one day with a member of my family, and made a remark that "he could not understand why I was so anxious to please him." This statement roused my sensitive feelings, and so worked upon my nerves to realise that I had sacrificed and devoted practically the best years of a young man's life for making a position, fulfilling duties demanded to the utmost of my ability, and for a question of this description to be asked was, to say the least of it, most insane. The result was, I lost confidence in the man and mistrusted him, leaving his service twelve months after. I conclude that confinement of one's life to work alone ultimately means loss of friends and tends to the downward grade of the social scale, besides which it is injurious to mind and body.

The sports and various staff gatherings of most interesting nature that we read of from month to month in the JOURNAL prove the unity and mutual affection existing amongst the enormous staff of the National Telephone Company, and I, as an humble unit, strongly advocate such recreations, as long as they are kept entirely separate from business and do not interfere with the daily work. It is with much gratification that we read—and I am sure we are all indebted to—the editor's neat comment on Mr. Parsons' letter. Brighton district had received a rebuke quite uncalled for, and the special correspondent was desirous of having the matter thrashed out openly. It was proved by facts and figures that the Company's interest had in no manner been neglected. The editor has cast away the gloom which for a time had fallen over that district, and not only encouraged them to go on, but expressed appreciation of the achievements noted in the Company's work. Sports and staff gatherings produce team work in every form and department. We become acquainted with each other better, and both mental and bodily faculties without doubt expand, to the interest of the Company. Whilst we observe the chief officers of the various departments—provincial superintendents and district managers—interesting themselves in various staff gatherings, by presiding over such, the individual desire is aroused to share the responsibilities of our respective district managers and chiefs in the welfare of the National Telephone Company, the outcome of which is the happy mutual attachment which exists between the Company and the staff. Therefore I think it will be generally admitted that sports and staff gatherings influence for good and not for evil.

Berkeley Street, Gloucester. STERIKER GASSIOT HARE.

THE CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to the last paragraph in Mr. Fraser's letter in the March JOURNAL, I think the difficulty referred to could be readily overcome by having a special examination upon the completion of the Courses. The correspondence class committee might set a series of questions representative of the whole Course, and send the same under cover to the district manager, who could then arrange for the students in his district to come together some evening to answer this examination paper. The answered papers would be returned to London, and the committee could then "judge of the inherent ability of each student," awarding the marks and certificates accordingly.

This would be much more satisfactory than the present system, as there is not the slightest doubt that some students only get the most superficial knowledge of the subject, for with a little assistance from others they are enabled to write out their answers correctly, and so obtain the required percentage of marks.

This is evidenced by glancing over the results for previous years. In some instances, three and even four students in a district have obtained exactly the same percentage of marks and a correspondingly high position on the lists, whereas, perhaps in another district, a student of more ability who has been plodding along by himself, only comes off with a second class percentage.

In order to encourage the sending in of the papers during the session 25 per cent. of the marks obtained for these might be taken, the other 75 per cent. being given for answering the special paper which is afterwards set.

Sheffield. E. STANLEY BYNG.

"PRODIGALITY IN CORRESPONDENCE."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. P. H. C. PRENTICE'S essay is extremely interesting, and even now an illiterate but grateful staff is doubtless under self-examination. Having had my own "mental astigmatism" corrected—for I could not have applied the simple word "redundancy" to a fault which even in my heteroptical condition I could perceive—it would be churlish not to reciprocate the favour.

Could one wish for a better example of redundancy than is afforded by paragraph 1 of your contributor's article? 14·5 per cent. of it (the bulk of the latter sentence), is pure repetition, and to say the least, it is not complimentary to the intelligence of your readers. With the conscious, as distinguished from the unconscious, examples before us, we must admit that some of us are illiterate, but we are not therefore of necessity fools.

Paragraph 3, however, adds the graver fault of antilogy, and even the Engineer-in-Chief's office does not *agree* to things unasked: one *agrees* with an already stated request, for it takes two to *agree*. But to the point: clearly the memorandum did not originate anything—witness the ridiculed redundancy of somebody's reply which brings out the interesting fact that there was an *amended* plan enclosed with the letter under acknowledgment. I think I am right in saying that it is a prerogative of the Engineer-in-Chief's staff to amend and return other people's plans. So it was not all redundancy after all.

Mr. P. H. C. Prentice's essay is extremely interesting. I wonder if that is sarcasm or redundancy.

Edinburgh, July, 14. —— EDGAR J. FRASER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I AM glad to read Mr. Prentice's article on the above, and should like to offer a sympathetic criticism and a few additions.

In the first place the examples he gives of prodigality by repetition are of course absurd, and, I trust for our credit, are not as common as Mr. Prentice would have us believe.

The phrase "Yours of yesterday" has perhaps come in timely season to relieve the congestion of brain work that is centring round the "Number, please," expression, and there will no doubt be divided opinion in favour of this phrase as against the more polite, if slightly longer, "Your favour" or "Your letter." Personally I prefer the latter. We may be paid to receive business correspondence, but there is no reason why a polite phraseology should not be thrown in if it is not at the cost of efficiency.

The system of reference adopted by the Engineer-in-Chief's Department is a good one, but its advantages are at present considerably restricted in the fact that it is confined more or less to that department. If the system was general it would, I think, be a very good one.

With regard to the printing of the word "Enclosure" at the foot of a letter, I think a much better plan is for the typist to stick an ordinary red wafer on the enclosure line at the top of the letter. The colour acts as a danger signal to the clerk responsible for putting up the letters and ensures that the enclosure referred to is not overlooked, at present a not uncommon occurrence.

On the point of giving a direct answer to a simple question, if a simple question is asked I have nothing to say, but I should like to suggest that the question is not always as simple as it might be. Not only is a phrase capable of a different reading to that intended by the writer, but a question is often so unfortunately worded that a direct reply is impossible and the point is, to say the least of it, obscure.

Mr. Prentice says nothing about another feature of prodigality in correspondence which, I think, is accountable for more inefficiency and waste of time than anything else—the delay in getting answers to questions on matters referred. It should not, of course, be necessary to have to send reminders week after week. I am speaking quite generally and without reference to any particular department or example.

Chester, July 18. —— T. A. BATES.

SUBSCRIPTIONS AND TESTIMONIALS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE number of subscription lists which circulate among the Company's staff has become such a serious matter, that it seems time to call a halt. No doubt when a member of the staff is transferred to another district, gets married, or leaves the service, it is a natural impulse to club together and give him or her a present. To a certain extent and within reasonable limits this is an excellent thing, and harmless; but with with a staff as large as ours it can very easily be overdone, and can become a serious tax on junior members and others in receipt of comparatively small salaries. During my stay in Canada, the Bell Telephone Company made a rule that no subscription lists should be sent round for any object whatever, without the express sanction of the president.

The writer has on one occasion received a very handsome present from his colleagues in London, and does not wish to appear ungracious, but on behalf of members of the staff perhaps less able to afford these frequent appeals, may I suggest that some such instruction be brought into force here?

We may not care to go quite as far as the Canadian company has gone, but I think it would be a very excellent move, and one which would be much appreciated, if Head Office were to forbid the circulation of a subscription list except in the actual office where the person to whom it refers is working. In cases where it is desired to make a wider appeal, I think the sanction of the Metropolitan or Provincial Superintendent should first be obtained.

London. JNO. H. BIGLAND, Divisional Contract Agent.

[One or two letters are unavoidably held over.

WHAT THE COMPANY IS DOING.

THE following exchanges have been opened during the month, making a total of 1,514 now working. Lucan (Dublin), Coleshill (Birmingham), Stow (Galashiels), Pill, Winscombe, Banwell and Winterbourne (Bristol), Chigwell and Purley (London), Chudleigh (Exeter), Ballincollig (Cork), Lutterworth (South Midland), Earby (Blackburn), Aberlady (Edinburgh), Helsby (Warrington), Creigiau (Cardiff) and Bingham (Nottingham). There was a net increase of 3,314 stations during the month, making a total of 463,869 stations.

Saffron Walden.—The Company has acquired premises at Market Row, Saffron Walden, and removed thereto its exchange, which was previously installed at a tradesman's in Market Street.

Great Yarmouth.—All the cable is drawn in for the underground scheme now being carried out in connection with the new common battery exchange.

Norwich.—An extension of the underground system, involving over 315 miles of wire, has just been completed.

Bristol.—During the past six months eleven exchanges have been opened in the district, and the Bristol common battery switchboard has been enlarged by capacity for 1,600 lines.

Private Branch Exchange.—Two orders have been taken in Bristol which are worthy of mention, one for three junctions and 43 stations, and another for four junctions and 85 stations. This last order was obtained from a branch of the Imperial Tobacco Company, who have previously fought very strenuously against the measured rates. The Co-operative Stores at Leeds have given an order for ten junctions and 86 stations. At Manchester, Kendal, Milne & Company, a large drapery and furnishing establishment, have taken seven junctions and 21 stations. At Warrington, Rylands Brothers have had installed four junctions and 22 stations. In Birmingham, Messrs. Tangyes, the well-known engineers, have taken five junctions and 61 extensions (eighteen of them external).

NEWS OF THE STAFF.

Mr. JOHN SCOTT, prior to leaving Manchester to take up his new position at Birmingham as Assistant Superintendent for the Midland Province, was presented by the Manchester district staff with a handsome Sheraton timepiece and fitted dressing case as a token of esteem and congratulation. Mr. Magnall, in making the presentation, spoke appreciatively of Mr. Scott's unfailing interest in all matters affecting the staff, and in conveying the best wishes of the staff for the future happiness and prosperity of Mr. Scott and his family, mentioned that the staff were conscious of saying good-bye to one whom they regarded, not only as district manager, but also as a friend. Mr. Scott feelingly responded, and in reviewing the strenuous times associated with his Manchester managership, exhorted the staff to retain an unflagging interest and energy in the hard work which still lay ahead, and to keep alive their sympathies with all associations and organisations which make for their betterment both in the official and social sense.

Mr. G. H. CRAMPTON (Portsmouth) has been transferred to the South Manchester district as Engineer.

Owing to the continued illness of Mr. T. MARA, formerly Assistant Engineer, Manchester, it has not been possible to wish him good-bye upon his retirement in a social gathering as was desired. A cheque has, however, been sent by Mr. Magnall, on behalf of the Company's staff in the Manchester district, which Miss Mara has suitably acknowledged on behalf of her father.

Mr. J. MCKEAN, Contract Officer in the Western district, retired after many years' service on July 2. He was widely known, and had made himself universally popular with his colleagues and also with the public. He was presented with an oak and silver salad bowl and a biscuit box to match, the presentation being made, in the absence of Mr. Bigland, by Mr. T. C. Potts, Chief Cessation Officer for the Western district.

Miss F. SMITH, Supervisor at the Central Exchange, Birmingham, has been appointed Supervisor-in-Charge at the Jewellers' Exchange, Birmingham.

Miss E. E. EADES, who has been Chief Operator at the Jewellers' Exchange, Birmingham, for a number of years, was presented by the day operating staff with a silver manicure set, and by the night operator with a silver shoe-horn and button-hook on the occasion of her transfer as Supervisor-in-Charge of the Victoria Exchange (Birmingham).

Mr. JOHN HOOD has been transferred from Glasgow to the district office at Stirling as Chief Clerk. Mr. Hood has done good work as Petty Cashier and as Record Clerk in Glasgow, and was only a few months ago transferred to the position of Cashier. On July 11 his colleagues presented him with a handsome watch.

Miss EDITH LOWE has been promoted from Senior Operator to Supervisor, Leeds Central Exchange.

Mr. H. G. SMITH, Chief Inspector, Dover, was on the occasion of his transfer to St. Albans as Inspector-in-Charge, presented by his colleagues with a set of razors in a mahogany case inscribed with his monogram.

Mr. A. COLEMAN, jun., has been transferred from Manchester to Liverpool as Assistant Engineer.

Mr. R. K. KEER, of the Manchester electrical staff, has had the degree of M.Sc.Tech. (electrical engineering) conferred upon him at the Manchester Victoria University.

Mr. H. GREEN, Engineer, South Manchester, has been transferred to the Engineer-in-Chief's Department at Head Office. On leaving he was presented with a drawing-room clock and a pipe and case as a mark of the esteem in which he was held by his colleagues.

Mr. R. W. RICHARDS, who has been transferred from the Cardiff district office to Newport, was presented by the district office staff with a silver cigarette case.

Mr. P. C. LANGRIDGE, of the Brighton electrical staff, has been transferred to Dover as Chief Inspector, and on leaving Brighton was presented by his old colleagues with a set of pipes and a tobacco pouch.

Mr. C. H. DAVIDSON, Exchange Inspector, Brighton, has been transferred to Great Yarmouth, and on leaving Brighton was presented with a kitbag and set of pipes.

Mr. H. C. TOWNSEND, Local Office Clerk, Cambridge, has been promoted to the Traffic Department, Metropolitan district. He was presented on leaving Cambridge with a silver cigarette case suitably engraved. Mr. Townsend recently obtained a first-class certificate in the Honours Telephony and Telegraphy Course at the London City and Guilds Examination, 1908.

Inspector FOX, Folkestone, on the occasion of his transfer to Ramsgate centre was presented by the members of the Folkestone staff with a walking stick and tobacco pouch, both inscribed with his initials.

Mr. H. W. DUNKERLEY, Oldham district office staff, passed with distinction in bookkeeping and arithmetic (senior commercial), and also passed in shorthand at 80 words per minute, at the Lancashire and Cheshire Institutes Examinations.

Miss EVELYN M. COLLIER, Junior Supervisor, Cardiff, resigned her position in the service on July 2, with the intention of taking up the nursing profession. Miss Collier has been in the Company's service for upwards of eight years, and has been a careful and reliable member of the staff. The operating staff presented her with a solid gold curb bracelet as a mark of esteem and with best wishes for her future welfare.

Miss EDITH VAN RIEL, Senior Operator, Cardiff, has been promoted to be Junior Supervisor, Cardiff, vice Miss Collier.

London Traffic Department.—*Promotions and Transfers:*

Miss C. HOOPER, Supervisor, London Wall, to be Senior Supervisor-in-Charge, Hammersmith.

Miss J. YULE, Operator, Paddington, to be Senior Supervisor-in-Charge, Redhill.

Miss F. BABB, Operator, Kensington, to be Supervisor, Hammersmith.

Miss E. JOHNSON, Supervisor, Hammersmith, to be Supervisor, Kensington.

Miss C. EVERARD, Operator, London Wall, to be Supervisor, Avenue.

Miss A. BILLETT, Operator, Gerrard, to be Supervisor, London Wall.

Miss E. FULLER, Operator, London Wall, to be Supervisor, Hop.

Miss M. BAILY, Clerk, Avenue, to be Supervisor, London Wall.

Miss J. CURRAN, Operator, Kensington, to be Supervisor, Paddington.

Miss B. FISHEL, Operator, London Wall, to be Supervisor, North.

Miss KNAPTON, on her promotion to Paddington, was presented with a pair of pearl and aluminium opera glasses by the Kensington staff.

Miss NELLOR, on her promotion from Hammersmith to Kensington, was presented by the staff of the former with a silver-mounted umbrella with engraved monogram.

The many friends of Foreman F. FARRELL, of Brighton (formerly of Reading), will regret to hear that he met with a serious accident on June 24. He was cycling down Falmer Hill, about four miles from Brighton, when, owing to the carelessness of a boy with a truck, a collision took place, and Mr. Farrell was thrown over his machine on to the road, fracturing his skull. He has been in the hospital ever since. He is now progressing, although it will be quite a couple of months before he is able to be about again.

MARRIAGES.

Miss ETHEL SMITH, Senior Operator, Manchester Central Exchange, has resigned to be married, and prior to leaving was the recipient of several handsome presents, including a silver cake basket, tea service, and trinket set. On the eve of departure she entertained her colleagues to tea and a whist drive.

Miss LILIAN HAMER, Senior Operator, Manchester, Central Exchange, has resigned to be married, and was presented with a dinner and tea service by her colleagues, whom she entertained to tea.

Mr. T. HIBBERT, Cashier, Manchester, was presented with a drawing-room clock by his many friends on the staff on the occasion of his recent marriage.

Mr. A. H. SERGEANT, Cost Clerk, Hull, was married on June 15. He was presented by the staff with a tea service and a set of carvers.

Mr. F. SLINGSBY, Exchange Inspector, Hull, was married on July 6, and was presented by the staff with an onyx marble clock.

Mr. F. FLEMING, Inspector, Hull, was married on June 27, and was presented by the staff with a handsome pair of bronzes.

Mr. ROBERT MOULT, Chief Inspector, Stockport, was presented with a case of silver by the members of the staff on the occasion of his marriage.

Mr. JOHN A. DICKINSON, Oldham district office staff, was presented with a china tea service on the occasion of his marriage.

Mr. T. A. CROWTHER, Chief Clerk, Leeds, was married on July 11. The staff presented him with a case of cutlery as a token of their esteem.

Miss MABEL WATSON, Supervisor, Leeds Central Exchange, resigned on June 18 to be married, after nearly ten years' service. She was presented by the staff with a silver cake stand and knife.

Mr. J. SMITH, Register Clerk, Leeds, was presented by the staff with a dining-room clock on the occasion of his marriage on July 11.

Miss AGNES BORRIE, Senior Operator, Charing Cross Exchange, Glasgow, left the Company's service on July 9 to be married. She was presented with a dinner service by the staff in her exchange.

Miss R. EDWARDS, Govan Exchange, left the service on July 2 to be married. Her colleagues presented her with a silver-backed brush and comb.

Mr. WALTER W. STANDRING, Chief Inspector, Rochdale, was presented by his colleagues with a handsome marble timepiece, tea service, and silver-mounted pipe to commemorate his marriage, which took place on July 1.

Contract Officer WARD, of Sheffield, was presented with a case of cutlery on the occasion of his marriage. The case was suitably engraved and was handed to him with the hearty good wishes of the Contract Department and others.

Miss M. E. GOODE, Clerk-in-Charge, Redhill Exchange, who is resigning in view of her approaching marriage after nine and a half years' service with the Company was presented with a handsome case of fish carvers by members of the Redhill and Croydon staff.

Mr. F. A. CAIRNS, Contract Officer, Croydon (London), was married on June 6, and was presented by the Divisional Contract Agent (Mr. E. W. Newton), on behalf of the staff at Croydon, with a set of safety razors complete.

Mr. T. S. A. WILLARD, of the Statistical Office, Salisbury House, was presented on the occasion of his marriage with a handsome marble clock suitably inscribed. The presentation was made on July 10, 1908, by the Statistical Officer, Mr. Albert Gray. The gift was subscribed for by over 100 members of the staff.

London Traffic Department.—*Leaving to be Married:*

Miss F. COOK, Operator, East, who recently resigned was presented by the staff with a set of oak trays.

Miss E. CRAWFORD, Operator, resigning from the same exchange, was presented with a trinket set and a fruit dish.

Miss J. SHAW, Operator, resigning from Ilford, was presented with a pair of specimen glasses.

Miss COLEMAN, Supervisor, Kensington, was presented with a silver-plated tea service.

Miss AITCHAISON, late Clerk-in-Charge, Paddington, on leaving to be married was presented by the operating and local office staffs at Paddington with a handsome silver-plated tea service. Miss Aitchaison wishes to take this opportunity of thanking all those friends who subscribed to the gift who she found it impossible to thank individually.

OBITUARY.

It is with regret that we have to record the death of a very old servant of the Company, Mr. PETER GLYNN, under somewhat tragic circumstances. He was seized with an epileptic fit whilst seated in the band enclosure at the Huddersfield Park during the performance, and died before medical assistance could be rendered. His old colleagues acted as bearers, and a subscription is being raised for his widow's benefit.

LOCAL TELEPHONE SOCIETIES.

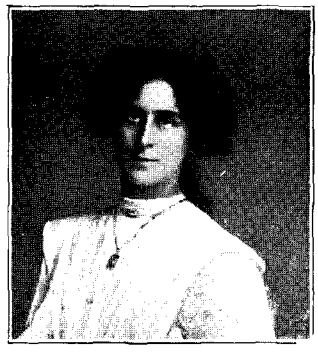
Birmingham.—On June 5 Mr. E. Williamson (District Manager) presented the prizes awarded by the committee to the following members of the staff for papers given before the society during the past session:—Messrs. H. W. Powell, A. H. Tilt and W. Randle. A special prize was given to Mr. J. L. Rhodes for the general interest taken in the various meetings.

Luton.—On June 16, Mr. S. Moody, Local Manager, Luton, read a paper, entitled "Ground Poles." There was a large attendance, Mr. J. H. Wilson, District Manager, being in the chair, and a very instructive time was spent. At this meeting Mr. W. Land was presented with a timepiece on the occasion of his leaving the Company's service.

Bradford.—The new committee held their first meeting on July 16 to make arrangements for the coming session. A new feature will be introduced by the undertaking of the Local Managers and their staff at the three out-centres each to provide the papers for one evening, and it is hoped by this means and by the introduction of a social evening to draw all the staff more closely together.

Glasgow Operators.—At a meeting of the committee the treasurer reported that there remained a credit balance of £7 0s. 5d. After discussion, it was agreed to grant £3 for the provision of prizes for the best papers and suggestions submitted by the members of the society and club during the ensuing session, and the balance of £4 to a Traffic Department benevolent fund, if instituted, or, failing that, for benevolent purposes among the members of the society and club.

RICHMOND-BLACKFRIARS SWIM.



MISS IVY ARMSTRONG.

A FINE performance was accomplished by one of the Company's operators in the great swimming race on June 27 from Richmond to Blackfriars, which was won by Jarvis, of Leicester. Miss IVY ARMSTRONG, then a student at the Metropolitan Operating School (now on the staff of the Gerrard Exchange), and a member of the Kingston-on-Thames Cygnet Swimming Club, came in first of all the lady competitors, having swum the distance of fourteen and a half miles in 4 hours 24 minutes 35 seconds, and giving a splendid exhibition of pluck and endurance. She was beaten by only fifteen of the men competitors, who numbered 33 in all, and included Ooms, the champion of Holland, and Beaurepaire, the champion of Australia. Miss Armstrong, who is only eighteen years of age, has already won 33 prizes for swimming, including four gold medals.

STAFF GATHERINGS AND SPORTS.

Leeds.—On July 4 a party of about 60 members of the Leeds male staff, mostly from the Engineering Department, had a very enjoyable outing to Liverpool. Leaving Leeds by the 7.55 a.m. train they arrived at Liverpool about 10.45 a.m., and by kind permission of the District Manager they were shown over the Royal Exchange. After dinner at the Stork Hotel the party went over the Cunard turbine liner *Lusitania* and then proceeded to New Brighton. Thanks to Mr. Wolstenholme (District Engineer, Liverpool, an ex-member of the Leeds staff), who had made most of the arrangements at Liverpool, the excursion proved very enjoyable, and after a most pleasant day the party returned to Leeds by the 8.30 p m. train.

Norwich.—The third annual bowls tournament of the Norwich Telephone Association took place on June 26 at Mount Pleasant, Norwich, on Mr. S. J. Duffen's green (kindly lent for the occasion). The result was: G. J. Hardingham (district office), first prize; H. J. Allen (Contract Department), second prize; H. H. Wigg (local office), third prize; A. W. Bell (Contract Department), fourth prize. The first prize was presented by Mr. H. H. Wigg.

Oldham.—The staff had their annual picnic on June 27. Arrangements were made for visiting Hardcastle Craggs. About 40 members of the staff and friends spent a pleasant time under most favourable weather conditions.

Southport.—The staff of this centre held their first annual picnic on July 4, some 36 members and their friends participating. Waggonettes left the Company's office for a ten-mile drive to Scarisbrick Hall, where the grounds were kindly thrown open. Some interesting sports were held in the Estate cricket field, after which the party availed themselves of a ramble in the grounds, subsequently returning to the hotel for tea. Here bowls and other games were indulged in. The journey home was completed by 9 p.m., everybody being pleased with the day's excursion.

Cardiff.—A considerable number of the local staff had their picnic on June 27, the place selected being St. Brides, near Newport. On arrival there they were met by a contingent from Newport. The afternoon was taken up by sports, the principal event being the tug-of-war for the Cardiff district shield, which, after a severe struggle, was won by Newport. The other events caused great amusement. After tea those present were photograped by a member of the staff. The distribution of prizes won in the sports followed, and advantage was taken of the occasion to make a presentation of a handsome Gladstone bag from the staff from Newport to Mr. H. J. Ginn, on his transfer to Cardiff.

Luton.—The second annual outing took place on July 4, when about 40 members of the Luton staff journeyed by brakes to Bricket Wood in Hertfordshire, where they were met by members from other parts of the district. A cricket match—the Outside Staff *v.* the Inside Staff—in which the latter proved somewhat easy winners, was much enjoyed. The pleasure of the return journey was spoilt by a heavy thunderstorm.

Thames Valley.—A rowing match for outrigged fours has been arranged between crews drawn from the staffs at Reading and Oxford respectively, and will be rowed on the Thames at Caversham, probably on the first or second Saturday in September.

Nottingham Factory.—The Wall Set Department, Nottingham Factory, held their second annual outing on June 27, and a most enjoyable time was spent at Woodhouse Eaves. A cricket match was played by two sides made up from members of the department; also some sports were held in which H. Spinks won the 220 yards, F. Cort the half and one mile flat races, F. C. Pringle, the long and high jump. Mr. Garner presented the prizes to the successful competitors after tea.

On June 27 the Sundry Instrument Department had their annual outing at Hoveringham Ferry. Cricket and other games were played, and notwithstanding the dullness of the weather a most enjoyable day was spent.

Sheffield.—The social club held the first excursion of the season on June 20. The outing consisted of a circular rail and drive through Derbyshire, the party travelling by train to Grindleford and driving from thence through the Derbyshire dales to Tideswell (a distance of 26 miles), where a substantial tea was awaiting the arrival of the party, who, needless to say, did full justice to it. A start for home was made at 7.45 p.m., Sheffield being reached at 10.15 p.m. It was unanimously agreed that the outing had been most enjoyable and successful.

The annual general meeting of the social club was held on July 7 last for the election of officers and other business. A favourable report of the year's work was given by the secretary, showing that the past year had been most successful from every point of view. The officers elected for the ensuing year were as follows:—Secretary, H. G. Rowe; committee: Misses A. Green, L. Robinson, E. Orrell, with Messrs. W. Burnett, W. Bowring, W. A. Skinner, and F. Jones.

West Kent District.—The second annual staff outing took place on June 20, Sevenoaks being the chosen place. On arrival a cricket match—Maidstone *v.* Chatham—was played on the Vine; Maidstone eventually proving easy winners. Tennis, croquet, and other sports were indulged in prior to facing the camera, the party then adjourning to the Limetrees Hotel for tea. After a very enjoyable outing the return journey was commenced at 9.15 p.m.

Tunbridge Wells.—On July 11 a cricket match between teams representing the Maidstone staff and the Tunbridge Wells staff was played at Tunbridge Wells. After a very enjoyable game Tunbridge Wells proved victorious by 84 runs. During the afternoon the visitors were entertained to tea on the ground, which was greatly appreciated.

Durham.—On June 27 the Durham district staff cricket team and supporters visited Newcastle-on-Tyne. A match in the first round of the Chambers Cricket Challenge Cup Competition was played against the Newcastle district team, the result being a victory for the visitors by six wickets. The team and friends were afterwards entertained to tea by the Newcastle staff.

Edinburgh.—The staff held their annual picnic on July 4 at Gosford House, Aberlady, the seat of the Earl of Wemyss. The day was fine, and a company of about 80 had a pleasant two hours' drive along the coast. A number cycled, and the meeting place made it possible for a party comprising operators from most of the sub-exchanges to join the company, which ultimately numbered over 100. Races and games were engaged in, and by courtesy of the factor a large number of the party were conducted over the mansion house, which is renowned for its interior decoration and objects of art.

Birmingham.—A staff picnic was held in Sutton Park on July 4 at which over 100 persons were present. A special feature of the gathering was the sports programme arranged by Miss Eades and Miss Williams, Messrs. Allen, Bagley, Creecraft, Cornfoot, Piggott, Thomas and Wood. It was decided to repeat the outing on Aug. 22, when a more complete list of events will be decided. In the cricket match, Ladies *v.* Gentlemen, the latter, who batted left-handed with broomsticks, were greatly surprised to find the team pitted against them contained a lady bowler from whom they could not score a single run and who took their wickets in a masterly manner. Score: Ladies, 18; Gentlemen, 22.

Walsall.—The annual picnic took place on July 4. The whole of the available staff, accompanied by several from Wolverhampton, thoroughly enjoyed a drive to the pretty village of Brewood *via* Calf Heath. Several members of the party cycled or joined on the way. An excellent tea was provided there, to which a party of 30 did ample justice. The District Manager, Mr. A. W. Smith, and Mrs. Smith, together with the Local Manager, Mr. R. S. Grosvenor, and Mrs. Grosvenor, were with the party, also Miss Wylde, Chief Operator, Wolverhampton, and Mr. Lucas, Contract Manager.

Nottingham.—The first annual outing of the combined staffs of the Nottingham district and Factory took place on July 11 at Plumtree. The sub-committee responsible for the outing had arranged a sports programme which was much enjoyed. The items and prize winners were as follows:—Ladies' slow cycle race: Miss Caunt, operator; gentlemen's slow cycle race: Mr. A. E. Smith. Sprint races: Ladies', Miss Atkin; gentlemen's, Mr. A. Smith. Egg and spoon races: Ladies', Miss M. Hooley; gentlemen's, Mr. A. Smith. Throwing cricket ball: Ladies', Miss Phillips; gentlemen's, Mr. H. Wilcockson. Three-legged race: Miss E. M. Sedgwick and Mr. E. Fitzpatrick. The tug-o'-war between picked teams belonging to the Factory and District respectively ended in an easy victory for the Factory. The names of the winners were as follows:—Messrs Martin, A. E. Smith, Sutherland, Stanton, Macaidie and Wilcockson. The tug-o'-war between two selected teams of operators caused much amusement. The winning team was composed of Misses E. Ford, F. Barker, T. Godfrey, M. Hooley, A. Caunt, F. Atkin, M. Husbands and L. Phillips. The District Manager and Local Managers at Nottingham and Derby were present.

Leeds.—*Cricket (Chambers Challenge Cup.)*—The Leeds staff played off their draw with the Hull staff at Leeds on June 27. Leeds scored 36, and Hull responded with 24, leaving Leeds victors by twelve runs. After the match, both teams and friends were entertained to tea at Collinson's Café. Leeds are drawn with Bradford in the second round, and meet at Huddersfield on July 18, when they anticipate putting up a good fight.

London.—On June 27 the staff of the Western contract office held their first summer outing, which it is proposed to make an annual institution. Leaving Waterloo at 1 45 p.m., the party travelled to Hampton Court, where they embarked on a steamer for Staines, which was reached in about three hours. Here an excellent tea was provided, after which there was a limerick competition and also a hidden treasure hunt, the prizes falling to Miss E. M. Payne and Mr. R. Cann, respectively. The weather fortunately left nothing to be desired, and on returning by rail to town at about ten o'clock everyone voted that the expedition had been an entire success.

Eighty Metropolitan fitters enjoyed an afternoon outing to Rye House, Herts, upon July 4. They boated, drove, walked in the hotel gardens, and played cricket, according to individual inclinations. During the afternoon a sport's programme was got through, with the following results:—One hundred yards' race: S. Easto (City), 1; H. Wilson (Western), 2; C. A. Richards (Sydenham), 3. Quarter-mile race: S. Easto (City) 1; F. Smeed (City), 2; H. Townsend (City), 3. Relay race: City team, 1; Western team, 2; Southern team, 3. Boot race: H. Townsend (City), 1; H. Pratt (Southern), 2; E. Eden (Southern), 3. Long jump: S. Easto (City), 15 feet 9 inches, 1; C. A. Richards (Sydenham), 2; H. Wilson (Western (3). A tug-of-war between City and Western fitters long discussed and practised for, was to have been the event of the day, but unhappily the rope provided by the caterers broke at the first strain put upon it, and no other being procurable each team is still the best in the eyes of its following. A knife-and-fork tea at 6 p.m. was followed by a smoking concert.

LONDON CITY AND GUILDS EXAMINATION.

THE following members of the Brighton staff passed the above examination in telephony:—

Honours.—First class: W. Goulden. Second class: P. C. Langridge and C. H. Davidson.

Ordinary.—Second class: H. Hatton, B. Waters, W. Jenkins, P. Hart, F. C. Chaplin and F. Crease.

The following members of the Sheffield staff have passed:

Telephony, Honours.—First class: W. D. Scutt, Thomas Parker and D. M. Skelton. Second class: T. W. Baker, Frank Brown, Frank McGraw and H. Mortimer.

Telegraphy, Ordinary Grade.—First class: E. S. Byng.

Telephony, Ordinary Grade.—Second class: Herbert Hemmington and G. C. Christie.

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TELEPHONE MEN.

XXVIII.—JOHN SCOTT.

MR. JOHN SCOTT, although a perfervid Scot, was born "faur awa' frae Bonnie Scotland" in Halifax, Nova Scotia, on Oct. 13, 1867. Brought home when about fifteen months old, on the termination of his father's engagement in Halifax, his earliest recollections are of the ancient town of Paisley, where he resided until he was eighteen. Educated at the John Neilson School, it was intended that he should follow teaching as a profession, and he underwent part of his training with that end in view. Ultimately a commercial career was decided on, and after gaining some all-round office experience in a large manufacturing firm, he entered the service of Messrs. D. & G. Graham, of Clarence Works, Glasgow. Mr. David Graham, happily still alive, was the pioneer of telephone work in Glasgow, as also of electric lighting and power as applied to coal mining, and Mr. Scott regards him as one of the ablest men he has known, and as the man who had most to do in shaping his career.

It was not until November, 1895, that Mr. Scott entered the service of the National Telephone Company. This was at Glasgow, under Mr. C. G. Wright, then District Manager. In February, 1896, he was appointed District Manager for the Border District and was transferred in a similar capacity to Blackburn in August, 1900, to Leeds on Aug. 1, 1902, and to Manchester on July 1, 1905. On July 1, 1908, on the transfer of Mr. Cotterell, the Assistant Superintendent of the Midland Province to the same position in the Southern Province, Mr. Scott was appointed to succeed him.

Mr. Scott combines the qualities of a good organiser and executive with sound practical and technical knowledge and a keen interest in the electrical side of telephone work. He gained the Kensington Science and Art Certificate for Electricity and Magnetism in 1882 and went through the electricity and magnetism course of Glasgow Technical School in 1890-2. He was elected a member of the Glasgow Philosophical Society in 1891. He is thus well qualified to take a useful part in the training and education of the staff, a valuable work in which he has always taken the liveliest interest.

Mr. Scott has read papers on several occasions at the Annual Meeting of Officers, and has always taken an active part in the discussions at those meetings; a keen critic, and a clear thinker and speaker, his contributions to the discussion have always both enlivened and enlightened his audience. He welcomed the appearance of our JOURNAL, and has been both a contributor and an active and valued circulation agent. In the social life of the staff and in inspiring and fostering *esprit de corps* and the spirit of co-operation Mr. Scott has always taken a whole-souled interest, and his hearty manner, his invariable good humour and his unaffected and genuine simplicity and honesty of purpose, together with the very human sympathy which goes with such qualities, have gained for him the goodwill of his staff wherever he has been. There are few more popular chiefs, and for a chief to exact strict discipline and the full measure of honest work from all hands, as Mr. Scott does, and still be generally popular, is a high testimonial to the character and qualities of the man.

Like more than one other active member of the staff Mr. Scott finds a fair proportion of his recreation in doing other kinds of

work. He is actively engaged in temperance and religious work, especially among young people, and has taken a prominent part in the proceedings of various literary and debating societies. His recreations are thus rather of a sedentary character and he has largely discarded football and bicycling for the more intellectual diversions of whist and chess. He is a great reader and an indefatigable walker. Since 1905 his chief hobby has been the Staff Transfer Association, and he has been a member of the Central Committee from the beginning. The staff could desire no sounder counsellor or more sympathetic supporter.

INTERNATIONAL CONGRESS OF GOVERNMENT TELEGRAPH AND TELEPHONE ENGINEERS.

A COMMUNICATION recently published in the *Electrician* states that an International Congress of Government Telegraph and Telephone Engineers, organised by the Hungarian Telegraph Administration, will meet on Sept. 21, 1908, at Budapest. From nearly everywhere well-known technical authorities have announced their intention to be present. Up to date the following Administrations have given notice of sending delegates to the Congress:—England, France, Germany, Bavaria, Austria, Italy, Belgium, Holland, Denmark, Sweden, Roumania, Bulgaria and Servia. Other Administrations have not yet definitely declared their participation.

The organisers have announced a series of highly interesting lectures and papers on professional topics. These lectures will be printed and distributed to the members before the opening of the Congress, so as to enable them to acquaint themselves with the text of such lectures and papers in view of subsequent discussion. It is hoped and anticipated that this will contribute greatly to the exhaustiveness of the debates. Lectures may be given in English, French or German, and the discussions will take place in these languages.

The Hungarian technical staff, with the ready support of the Minister and Director-General, have provided that the members of Congress shall not only be afforded an opportunity of inspecting the Hungarian technical installations at Budapest, but also the large electrical plants and factories where telegraph and telephone apparatus and material is produced.

The sittings of Congress will be held in the building of the Hungarian Engineers' and Architects' Association, who have kindly offered their newly adapted premises for the occasion. The Hungarian committee entrusted with the arrangement of the Congress will shortly distribute a detailed programme of the Congress, and will give any information that may be desired. A list of the hotels recommended by the committee will be distributed, setting out the terms of accommodation. The committee will be glad to advise any members requiring rooms.

Those interested in the Congress are requested to apply for information to Mr. Endre Kolossváry, Chief of the Technical Department, Direction Générale des Postes et des Télégraphes, II. Albrecht ut 3, Budapest, Hungary.

PORTSMOUTH BENEVOLENT FUND.

THE question of establishing a staff benevolent fund has been under consideration for some considerable time and at a meeting of the staff held under the presidency of Mr. S. J. Smith, District Manager, on May 19, it was unanimously decided to establish such a society. A set of rules drawn up by a provisional committee was adopted. Considerably over 150 members have signified their intention of joining, and it is confidently expected that the society will prove of great benefit to the staff generally.

TELEPHONE FIRE ALARM WORK.

ANOTHER instance of the utility of the telephone in cases of fire comes from Fraserburgh. A fire broke out in a draper's shop and by some means a wire hoop, used for holding dress material, fell across the arrester terminals, thereby short circuiting the line, and dropping the indicator in the Fraserburgh exchange. The Company's local inspector, finding no one on the circuit, looked out at the exchange window to ascertain what sort of night it was (knowing from experience that at this period of the year frequent contacts are due to severe weather conditions) and saw smoke issuing from the subscriber's premises. He went immediately to the place and bursting open the front door crawled in and ascertained the seat of the outbreak. By his prompt action the fire brigade were early apprised of the fire.

BRANTFORD'S MEMORIAL MONUMENT TO ALEXANDER GRAHAM BELL.

THE people of Brantford, Ont., have just finished raising the sum of $40,000 for a memorial to Professor Alexander Graham Bell. It was just outside of the city that Professor Bell made his first successful experiments with the telephone, and Brantford has ever since been known as the "Telephone City." With this money subscribed, several blocks of land in the centre of the city have been purchased and will be turned into public parks. In addition, a monument will be erected to perpetuate the name of the inventor. All this has been done by a little city with a population of barely 20,000 souls. A few days ago Professor Bell visited the city, and the Brantford *Expositor* took advantage of the occasion to make the following excerpt from its issue of Aug. 11, 1876:—

"Friday night a number of gentlemen from town were the guests of Professor A. Melville Bell at his beautiful home at Tutela Heights. The object of the gathering, besides the enjoyment of the large-hearted hospitality of the host, was for the purpose of meeting E. S. Symons, Esq., Under-Secretary of the Colony of Victoria, the brother-in-law of Professor Bell. Among the guests were Professor D. C. Bell, Professor A. Graham Bell, of Boston; Sheriff Smith, Principal Hunter, of the Blind Institution; A. Robertson, Esq., Manager of the Montreal Bank; William Patterson, Esq., James Wilkes, Esq., A. J. Wilkes, Esq., F. B. Fitch, Esq., W. H. C. Kerr, Esq., Dr. Corson, Henry R. Corson, Esq., of Markham, Ont.; Dr. Digby, Dr. Philip, J. T. Gilkinson, Esq., and William Watt, Esq. . . . A rare treat was afforded the guests in the experimental explanation made by Professor A. Graham Bell, of Boston, of the new system of telephony lately invented by him. Instruments were placed, one in the porch of the residence and the other in an outhouse in the grounds, and communication made between those with ten miles of wire. Musical notes, the human voice, songs, spoken and sung before one instrument were plainly audible by placing the ear to the instrument at the other end.

"On Thursday Professor Bell had communication made with his instrument on the common telegraph wire between Brantford and Mount Pleasant, a distance of five miles, and was spoken to while in Mount Pleasant with Professor D. C. Bell and Mr. Griffen from the Dominion office at Brantford. Last evening the professor tried a different experiment so that three persons could sing different tunes or different parts of the same tune into the instrument at the same time. The trial was perfectly successful, the different voices coming distinctly over the wire at the same time so that they could be separately distinguished by the listener. After the experiments a banquet was served and speeches made by a number of those present."—*American Telephone Journal.*

SYSTEM RUN MAD.

(From an American source, anonymous.)

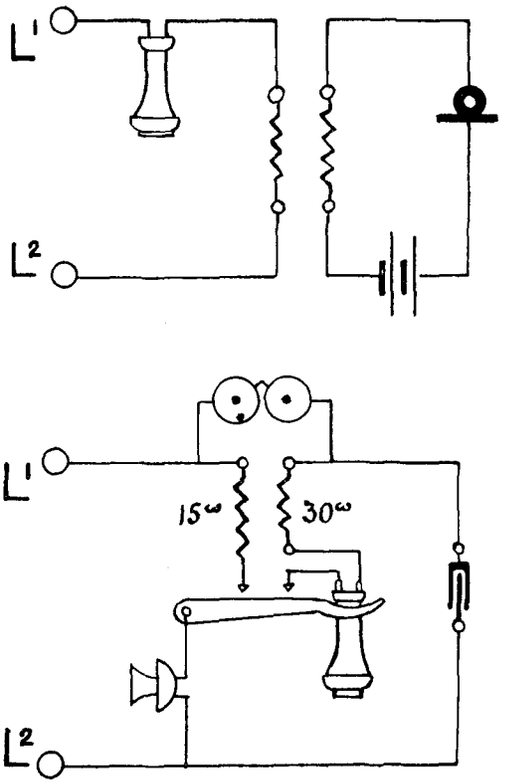
OH, isn't it great to be "Up to date"!
And live in this year of grace,
With a system and place for everything,
Though nobody knows the place!
We've an index card for each thing we do,
And everything under the sun;
It takes so long to fill out the cards,
We never get anything done.
We've loose-leaf ledgers for saving time,
The Lord knows what they cost!
When half our time is spent each day
Hunting for leaves that are lost.
Stenographers who spell like h——
And make us swear and cuss,
When we are not dictating to them,
Why, they are dictating to us.
And sectional this and sectional that
(We'll soon have sectional legs),
I dreamt last night that I made a meal
Of sectional ham and eggs.
I dreamt I lived in a sectional house,
And rode a sectional "Hoss,"
And drew my pay in sections from
A sectional "section-boss."
Oh, isn't it great to be "Up to date"!
And live in this year of grace,
With a system and place for everything,
Though nobody knows the place.

SOME POINTS ON CENTRAL BATTERY INSTRUMENTS.

BY J. H. STEWART, *Electrician, Paddington Exchange.*

IT is perhaps not generally realised how different the central battery subscriber's instrument is in operation from its magneto predecessor. The fact is possibly disguised because of the superficial resemblance between the two, each consisting of a receiver, microphone, induction coil, switch hook and bell, but the arrangement of the parts and the way they work is so different in the new instruments from the old that it will be instructive to compare the points of likeness and divergence.

The switch hook bears a strong resemblance to that in the late pattern silent ringer magneto instruments. This switch hook was strong and reliable in its action and its revival in the new instruments bears testimony to its excellence. There are, however, important differences between the two. In the old instruments one of its functions was to remove the bell from the circuit, either by disconnecting in the older types or short circuiting in the later, when the



FIGS. 1 AND 2.—CENTRAL BATTERY INSTRUMENTS.

receiver was removed from the rest. In the central battery instrument, on the other hand, the switch hook does not control the bell at all, the latter being permanently across the line with a condenser in series. The object of the hook is to break the path for the central battery current when the instrument is not in use; it then removes the low resistance shunt that the microphone and induction coil form across the bell while speaking. The new switch hook, too, forms no part of the circuit, the contact which it carries not being in electrical connection with the hook itself; this is a safety device, so that accidental contact of the hook with live electric light fittings shall not introduce high potential currents on to the telephone circuit. Another departure is that the hinge is not included in the circuit. Continuity is secured by means of a flexible band, and as long as this remains intact there can be no intermittency. This device was used to some extent on the old magneto bells, but the flexible band was an auxiliary to the hinge, which formed part of the circuit; the band was weak and very frequently broke, leaving the hinge connection only to complete the circuit, and this would not be good enough for central battery working. Dwelling so much on this part of the apparatus may be justified by quoting an American opinion, which is certainly true and is expressed in the best Yankee style: "The switch hook is a little thing, yet if not made right is a regular rat's nest of trouble!"

The induction coil, again, bears a superficial resemblance to that of the magneto instrument, but it is so different in action that one cannot even refer to the windings as primary and secondary respectively, as in magneto working. For incoming speech the 15ω coil is the primary and the 30ω coil the secondary, but for outgoing speech the 15ω winding works as the secondary, the 30ω winding being the primary. Another point of difference between the central battery and the magneto coil is that in the former the hearing depends upon the inductive action of the coil, while in the latter the coil does not assist the hearing at all, indeed it tends to weaken it, as the secondary winding, which is in series with the receiver, is merely an idle resistance, or rather an impedance so far as incoming speech is concerned. Fig. 1 should make this clear. The receiver of a central battery instrument, instead of being in the line circuit as in Fig. 1, may be regarded as forming part of a local circuit, consisting of the induction coil, condenser and microphone in series with it (see Fig. 2). It has already been said that the hearing is due to the induction coil; incoming speech waves entering at L^1 and arriving *via* the 15ω coil at the switch hook contact do not traverse the receiver, 30ω coil and condenser, to L^2, but find a much easier path to L^2 through the microphone; these alternations passing through the 15ω coil, induce corresponding currents in the 30ω winding, and it is to these induced currents the receiver responds.

The microphone, like the receiver, is also put into a new position. Instead of being in a local circuit, it is inserted in the line (Fig. 2). This being so, it becomes imperative to use a microphone that works satisfactorily through comparatively large ranges of voltage at its terminals. The single contact or carbon pencil microphones of former days would never have done; they

FIG. 3.—CENTRAL BATTERY INSTRUMENTS.

would have become faint on the one hand or noisy on the other if the voltage diminished or increased. It may here be noted that though one of the advantages claimed for central battery working is the constancy of the current that can be maintained through the microphone compared with that of a microphone fed by local cells, yet the actual current supplied to a particular instrument depends very largely on the distance at which the instrument happens to be from the exchange. For example, a call office instrument on the exchange premises, with practically no line resistance, will have three or four times as much current passing through the microphone as a similar instrument at the end of a 350ω loop. Granular transmitters are the only kind that work satisfactorily under central battery conditions and among granulars the solid back is found to answer best. It is interesting to note that in transmitting, the currents sent consist largely of pulsating as distinguished from true alternating currents, while the currents received are entirely alternating. This is because the pulsating currents are transformed into alternating by the repeating coil at the exchange.

And now as to the relative merits of the hand-microtelephone and the solid back transmitter. A large number of experiments have been made at Head Office with an experimental standard cable kept there for transmission tests, and it is found that hand-microtelephones are no better when connected immediately at the ends of a junction (see Fig. 3) than solid back transmitters are at the ends of 300ω loops of open wire at each end of the same junction. Another way of putting it is this: The 300ω loops of wire are together equivalent to about ten miles of standard cable, so that for a junction of any length with solid back transmitters directly on the ends the speaking would be as good as with hand instruments fed with two average dry cells over a junction ten miles shorter. This, of course, is an important gain in transmission, when it is remembered that the length of standard cable that can be spoken over before the limiting distance of speech is reached is only 46 miles. This

limiting distance is an arbitrary standard, which is differently fixed by different authorities; the standard of 46 miles is fixed upon by some because it is considered, as a result of actual experiment, that in spite of the attenuation or loss of volume when speaking through such a length of standard cable, the resulting speech is still commercially good.

To sum up, it will be perceived that we are in a region of topsy-turvydom when comparing the magneto with the central battery instrument. In the former the bell is controlled by the switch hook, the receiver is in the line circuit, the microphone is in a local circuit, the induction coil is not operative for incoming speech and either the primary or secondary windings may be reversed with impunity. In the latter, the bell is not controlled by the switch hook, the receiver is in a local circuit, the microphone is in the line circuit, the induction coil is operative for incoming speech and reversing either one of the induction coil windings badly affects transmission.

THE TELEPHONE SITUATION IN FRANCE.

IN the following article, published in *Le Journal*, Paris, Mr. Noulens, "reporter" of the Committee of the Chamber of Deputies on Posts and Telegraphs, comments on the telephone crisis in Paris in somewhat freer terms than in his official report.

The universal indignation aroused by the Paris telephone service is fully justified. Prolonged delays in answering calls, bad hearing and repeated interruption of conversation, are the ordinary features of the Paris telephone service, and are daily endured by the unhappy subscribers.

Paris, which of all French towns should have the best telephone service, by reason of the volume and importance of business affairs in Paris, is certainly the city where the service is the worst. Of all the capitals of the civilised world ours is also the worst served from a telephone point of view. This lamentable state of affairs is due to a variety of causes.

Dominated by the routine methods which are so characteristic of it, the Administration has not foreseen the rapid development of the telephone. Why should it seek to popularise this method of communication, since, from the Administration point of view, it appeared to be a luxury reserved only for the few?

But forcibly the telephone has become an important factor in both business and social life, and the Administration, taken unawares by the growth of the demand, finds itself to-day incapable of meeting the reasonable requirements of the public.

Twenty years ago, when the first switchboards were put in service—some of them are still in use—calls were completed in a satisfactory manner, because the system was small. The increase in the number of wires, of instruments, and of operators has not sufficed to keep up the standard of the service, because the traffic has grown in an even greater degree. In telephone work the service is relatively simple when only a small system is concerned, but an extremely complicated organisation is required for a system like that of Paris, which at the present time carries an average daily traffic of about 450,000 calls. At each stage of the technical development of the telephone system a complete transformation of the plant should be made and not a mere extension of the plant in use.

This feature of telephone work has been perfectly realised by the Americans. Every improvement in telephony which has proved practical has been adopted by them as quickly as possible. In this way they have periodically renewed their telephone systems. Since 1895, for example (the correct date is 1898), New York City has been served by the central battery system, which the French Administration has only this year decided to adopt in Paris and which will not be fully available in Paris until 1909.

The increasing use of the telephone service makes it necessary that the exchanges should be worked by operators both carefully selected and systematically trained. The telephone operators do not deserve all the reproaches of the public. The insufficiency of junction lines between exchanges and the bad condition of the switchboards are the principal cause of the slowness and inaccuracy of the service. However, it is most desirable that the Administration should take greater care in recruiting its telephone staff, selecting as operators only those young women of sufficient mental and physical activity to qualify them for the work.

The public itself needs some education in telephone operating and should observe the reasonable instructions for working the telephone. It is only in this way that the service can be made of high efficiency. It is because the subscribers habitually neglect to give the ring-off signal that the lines are frequently blocked needlessly, and the operators, accustomed not to rely on the signal, often interrupt conversations for the purpose of discovering whether the line is still in use. The central battery system will simplify the work of the subscriber in this respect, as the signals are given automatically by the simple act of taking down and replacing the receiver.

The telephone is specially adapted for short, urgent and useful communications. It was part of the mission of the Administration to put an end to the abuses which result from the use of the telephone for frivolous and useless calls by substituting long ago the measured rate tariff for the flat rate tariff. By such a measure the Administration would have benefitted both itself and its customers. Is it reasonable that the subscriber who makes two or three daily calls should pay the same rate as he who makes 50 daily calls? The only rational tariff is that which charges the subscriber in accordance with the number and duration of the calls. It has been necessary for the majority of other nations to adopt this system of telephone charges before our Administration should even consider applying it in France.

The project of law deposited by Mr. Simyan (Under-Secretary of State for Posts and Telegraphs) some months ago, which was referred to the Committee on the Budget, provides for an expenditure of 30,745,000 frs. for the improvement of the Paris telephone system. Out of this amount 27,000,000 frs. will be expended in the construction of six new exchanges. The rest of the vote will be expended on extending the capacity of the existing exchanges.

Among the six new exchanges planned for, three are required to cope with the normal increase of subscribers. The mission of the others is to provide capacity for the increased demand which will arise from the adoption of measured rates. It is evident that when the uniform rate of 400 frs. is abandoned and replaced by a graduated scale of rates bearing some proportion to the use of the individual subscriber, there will be such an increase in the demand for telephone service that a large addition to the plant will be required. The Bill introduced by the Government very properly provides for this eventuality.

However, the adoption of the measured rate tariff will have another effect; the example of New York, Berlin and London shows that the average number of calls per subscriber will be reduced from ten to four, which will enable each operator to serve a larger number of lines than at present. This factor, which would appear to justify a reduction in the number of new exchanges planned for, seems not to have been considered. The Administration, often accused of neglect, has been anxious this time to do things with a liberal hand, at the expense of the taxpayer. Unhappily the extensive programme outlined, providing for the construction and equipment of six new telephone buildings, cannot be realised in practice, according to the admission of the Administration, for another four or five years.

We should have wished for this reason that the scheme of establishing new exchanges which will not be available for some years to come had been accompanied by some suggestions of means to cope with the situation more promptly.

The principal cause of the growing inefficiency of the Paris telephone service is the lack of an adequate provision of junction lines between the exchanges. It is impossible to provide additional lines, as there is no switchboard apparatus available for working them, and in most of the buildings no space to accommodate additional switchboards. In order to obtain additional exchange capacity without costly building operations and long delay, telephone experts have suggested the establishment of small exchanges of 2,000 to 3,000 lines in buildings which could be rented in different parts of Paris. This very practical method, which has been adopted, for example, in London, would provide at any rate a temporary relief within a few months. Nevertheless our Administration is not disposed to adopt this plan.

What measures does the Under-Secretary of State eventually intend to take? The central battery system, which will be generally

adopted next year in the Paris system, will, without doubt, improve the service, but will in no way remedy the troubles due to lack of junction lines.

It seems then urgent to discover as soon as possible some means of insuring a telephone service in Paris of reasonable efficiency. *The Administration cannot neglect the improvements* urgently demanded by the intense discontent caused by the present service and nail its flag to a programme which will yield useful results only at the end of another four years. If the Administration adopts this attitude it takes the risk of driving the long-suffering Parisian subscribers to absolute desperation.

AMERICAN TRAFFIC METHODS.

FROM an article in a recent number of *The Times Engineering Supplement* on "Telephone Progress in America," by Mr. H. Laws Webb, we cull the following interesting passages:—

> The secret of the extensive use of the telephone in America is that telephony in that country is a highly specialised technical business, whereas in Europe it has been the sport of politics, and has generally been relegated to the position of a minor branch of the government department responsible for posts and telegraphs, a position in which enterprise, scientific organisation and continuous study of the requirements of the public are not to be found.

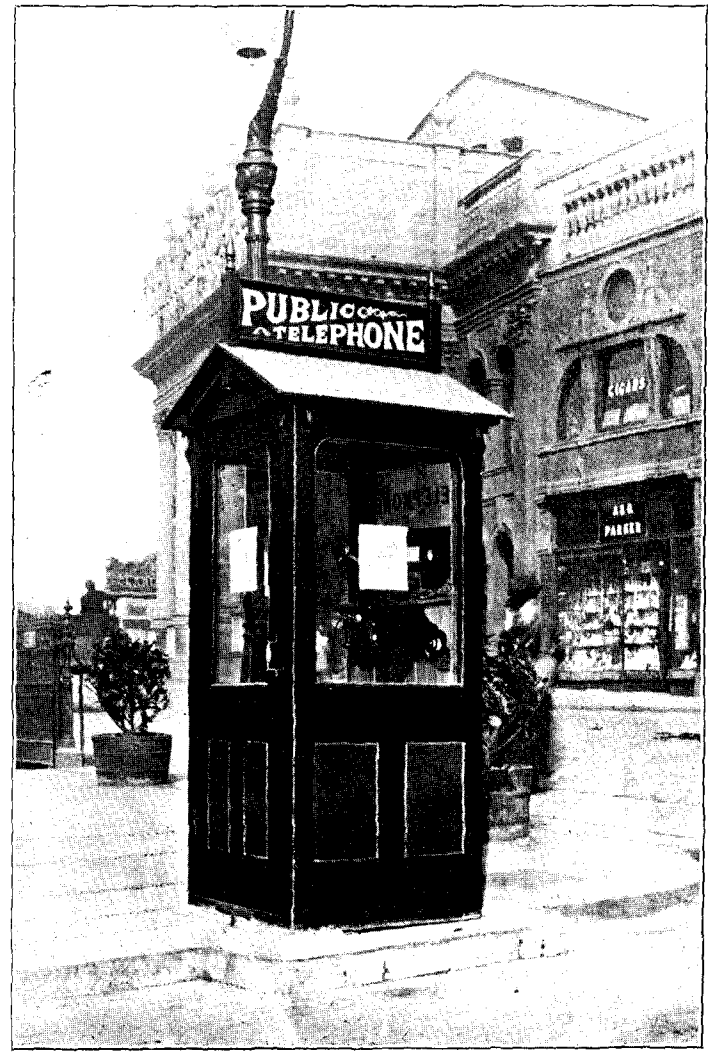
After referring to the uniform central battery equipment of the large American telephone systems the article proceeds as follows:—

> But the most interesting feature of American telephone administration, the one that is responsible for a city service of 30 seconds, a suburban service of very little more, and a long-distance service of a few minutes, is the Traffic Department. The Traffic Department constantly watches the traffic, tests and measures the traffic, analyses it and studies it from every possible point of view. It selects and trains the operators, supervises them continuously after they are trained, and is constantly on the look out to improve their methods and correct any tendencies which may make for lax or erroneous working. It takes daily (and nightly) samples to test the speed and accuracy of the service; it follows with persistency Lord Kelvin's maxim that no scientific work can be done without measuring, and it continually measures everything—the time of each step in a call, the daily and hourly load of the switchboard, of the line, of the position, of the operator. Its statistics and reports show from day to day, week to week and month to month the performance of every part of the system, telephones, lines, switchboards and staff, and continually furnish indications for improvements and economies.
>
> The scientific supervision of traffic which is so conspicuous a feature of American telephone practice costs a lot of money, but it pays. It pays in two ways: first, because the high efficiency of service which results encourages the public to use the telephone freely; and secondly, because improved efficiency means greater economy. The rates for suburban and long-distance calls in America are relatively high—according to European standards—if one regards the money only; but the fact is that one cheerfully pays a shilling for a 25-mile call when one gets through always in a minute, and one grudges a sixpence for the same distance when one has to wait about for a period varying from ten minutes to an hour or more, as habitually occurs in every European country. The difference in value is so great that the difference in price becomes insignificant. I venture to say that 99 out of 100 business men in Great Britain would gladly pay twice the rates they now pay for trunk telephone calls if they could be assured of a service approaching the efficiency of the American service.
>
> It may be fairly urged that really high efficiency of service is the *crux* of the "telephone question"—infinitely more important than the question of tariffs, which provokes so much controversy—and that high efficiency is only to be attained by a very thorough organisation for the supervision and study of telephone traffic. The traffic is a telephone administration's whole business, or very nearly its whole business, yet in European government telephone departments it is the part of the work which obtains the least attention.

STREET CALL OFFICES.

BY W. HAIMES, *Contract Manager, Nottingham.*

A FEW months ago arrangements were completed with the Nottingham Corporation to place six call office cabinets on public property in prominent positions in the city. From the illustration given it will be seen that, with the exception of the sloping roof, the cabinets adopted are of a somewhat similar design to the



STREET CALL OFFICE, NOTTINGHAM.

standard pattern silence cabinet, having three glass sides and occupying a ground space of 3 feet square.

The new call offices were opened to the public in March last and have proved extremely popular. The difference between the fees taken from the kiosk call offices and those taken from ordinary call offices is considerable, and tends to confirm the opinion that many persons hesitate to use a shop call office owing to a feeling that by doing so they place themselves under an obligation to the attendant. Other advantages of the street cabinet are: (1) Continuous service, (2) privacy, and (3) advertisement.

In return for the facilities granted by the Corporation, the police are allowed free use of the cabinets for the purpose of communicating with the Central Station; and to enable the Central Station to signal the policemen an indicator is fitted in each

cabinet. Constables at regular intervals visit the cabinets, and upon finding an indicator showing red the policeman enters the cabinet, restores the indicator by means of a special key, and calls up his station.

A little trouble was at first experienced from small boys ringing up and asking the operators foolish questions, but this kind of thing is quickly dying out as the novelty wears off, and in the course of time will, with the co-operation of the police, almost disappear.

Current for lighting the cabinets is supplied from the Corporation mains at a fixed annual sum, and the lights are switched on and off by their staff at the same time as the street lights.

The style of cabinet selected fully serves its purpose, is not too expensive, and therefore permits its use being extensively adopted. From experience gained in Nottingham and elsewhere it is suggested that the use of street call offices could be extended throughout the country with advantage.

The writer would be pleased to supply further information on the subject to members of the staff who care to communicate with him.

A TELEPHONE STATION ON THE ROYAL YACHT.

By J. B. SMITH.

THURSDAY, July 9, was a memorable day for Bristol; the Royal Edward Dock at Avonmouth was then opened by His Majesty the King accompanied by H.M. Queen Alexandra. The

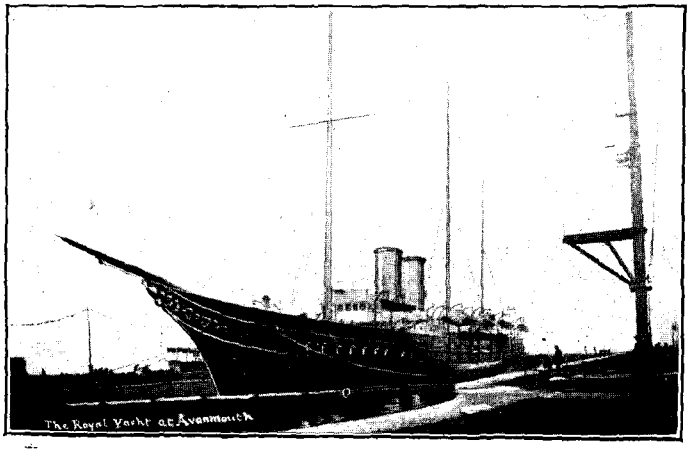


FIG. 1.—THE "ALEXANDRA" IN THE ENTRANCE LOCK.

special feature of the occasion was that from its arrival on Tuesday until Friday morning, the King's yacht was connected by telephone, and a few particulars of the arrangements made cannot fail to be of interest to the readers of the JOURNAL.

The request for the royal yacht to be put "on the telephone" received from the Admiralty, who specially required the yacht to be connected both when she was at the entrance lock prior to the opening ceremony, and also later in her altered position during the ceremony near the royal dais.

The order was received a few days before the visit, and a line of twelve poles was erected at Avonmouth and 750 yards of circuit were run from the nearest pole to the position taken up by the *Alexandra* in the entrance lock shown in Fig. 1.

A length of 100 yards of cable was taken underground at the side of the lock, stapled along the temporary landing platform and coiled up ready to be taken on board the yacht on its arrival. In order that connection could be made with the yacht when moved to her second mooring where she lay during the opening ceremony a Post Office cable was utilised for 250 yards to the nearest pole.

The poles erected had to be specially requisitioned and were promptly despatched by Head Office. The wayleaves required were also obtained from the Bristol Docks Committee in record time, and the work, begun on Monday, was completed on Tuesday when the royal yacht arrived. Connection was then made with the Bristol Exchange, the line being taken through a porthole into the department reserved on board the vessel.

At the time of the ceremony the *Alexandra* steamed across from the entrance lock (No. 1 on the plan), cutting the ribbon on her journey, and took up a position at the side of the dock (No. 2), where His Majesty stepped ashore and declared the docks open. Although the yacht was only absent from her first moorings for the space of about an hour during the ceremony, it is interesting to note it was considered of great importance that telephonic communication should be available all the time.

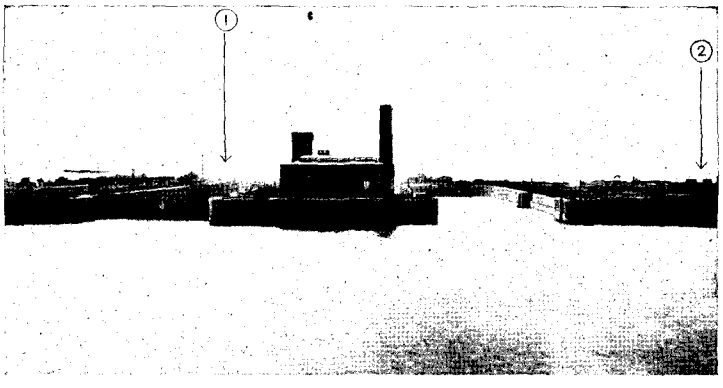


FIG. 2.—THE KING EDWARD DOCK, AVONMOUTH, SHOWING FIRST AND SECOND POSITIONS OF THE ROYAL YACHT.

Their Majesties slept on board the yacht on Wednesday and Thursday night and the line was finally disconnected (without a red notice) on Friday, the 10th, just before departure. The Court Postmaster on board, in conversation with one of the Company's officials in attendance, expressed himself fully satisfied with all the arrangements. He stated that conversations with Buckingham Palace were perfect. No State secrets will be revealed by saying that the telephone was very much used. During its short period of service nearly 200 calls were made, about one-third being trunk calls. The local authorities also expressed their satisfaction with the complete and satisfactory arrangements made.

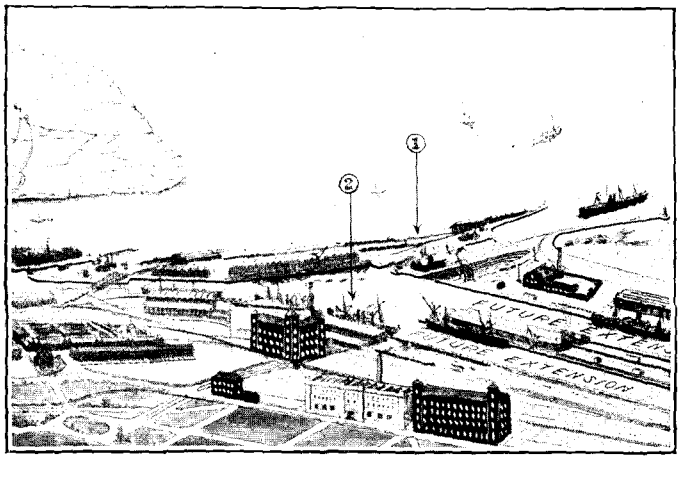


FIG. 3.—PLAN OF THE DOCK SHOWING THE TWO POSITIONS WHERE TELEPHONE SERVICE WAS SUPPLIED TO THE ROYAL YACHT.

A few remarks on the new dock at Avonmouth may be of general interest to readers.

The "first sod" was cut in March, 1902, by H.R.H. the Prince of Wales. The dock proper is 1,000 feet wide east to west and has a mean length of 1,120 feet north to south, and is connected with the older dock. The depth of water is 33 feet. There is provision at the northern end for large extentions at a small cost. The dimensions of the entrance lock are such that the *Mauretania* would have plenty of room, while in the dock proper she would have space enough to turn round, and in the graving dock her hull or

that of the largest battleship of the Royal Navy could be examined and repairs done. The entrance lock is 875 feet long and 108 feet wide. Three huge pairs of gates operated by hydraulic machinery close this lock, the middle pair coming into use when a vessel of small size is locked through. The dry dock is 100 feet at bottom and 126 feet at top, and 850 feet long. From this outlay and enterprise, great expectations are entertained.

An exchange was recently opened at Avonmouth, and there should be good field for telephone enterprise there, which is not being overlooked by the Bristol contract staff.

It only remains to add that the King graciously conferred a knighthood on the Lord Mayor of Bristol, who is a member of the Imperial Tobacco Company of Great Britain, a firm who have just given an order for a large private branch exchange installation, mentioned in another column (p. 112).

SMART CONTRACT WORK.

HINTS THAT MAY ASSIST CONTRACT OFFICERS IN PRIVATE BRANCH EXCHANGE DEVELOPMENT.

BY J. J. CURRIE, *Contract Officer, Liverpool.*

A PERUSAL of the paragraph headed as above in a recent issue of the JOURNAL imbued me with the idea that a few points dealing more especially with private branch exchange development might prove not only interesting but instructive and encouraging to contract officers throughout the service. I do not for a moment suggest that the men comprising this branch of the Company's staff are lacking in their efforts or ability, but in my opinion the development of private branch exchange service has been retarded by a more or less erroneous impression on the part of some contract officers that the service will be too costly to the subscriber, and consequently failure to convert him to the new system will follow. A few interviews, patience and perseverance will soon dispel this idea from the mind of the contract officer, and instead of possible failure staring him in the face he will find "success" loom up so prominently that failure if it comes along will be quite a surprise.

Dealing with the paragraph mentioned above great praise is due to the contract officer referred to, but I think it is by no means an isolated instance of smart work on the part of contract managers and officers generally, and in my opinion a column devoted to recording such items in each issue of the JOURNAL—a practice adopted by several American telephone journals—would afford some interesting reading and give many examples of the ability displayed by contract officers under "emergency" circumstances, and, what is more, should tend to promote that healthy emulation so essential for development of any business.

Take for instance a contract officer of my acquaintance who deals with a large portion of the commercial area of the city. He makes a point of keeping in touch with the contract manager by ringing him up at intervals during the day, so that anything arising in the particular district where he is located receives prompt attention, thus effecting a considerable saving of time and correspondence, while the promptness gives satisfaction to the subscriber.

One day in February last this contract officer telephoned as usual. "Call upon Messrs. So-and-So about an urgent removal," replied the contract manager. This message was received at 4.40 p.m., and five minutes later the subscriber was being interviewed. At 5 p.m. the contract manager received a message to prepare the usual letter quoting for private branch exchange service, and while this letter was in the hands of the typist the contract officer had returned to the office and was preparing an agreement. At 5.25 p.m. he was again with the subscriber, and at 5.55 p.m. he returned to the office with the contract signed. The exact time occupied from the opening of negotiations was one hour fifteen minutes, almost a record performance.

The next incident which I have to relate appears almost incredible at first sight, but it can be verified by our contract manager and his clerical staff. I had proceeded this far with my article (on April 9), the feeling of emulation still prompting me to "go one better" than the announcement which prompted these notes. By a peculiar coincidence my chance came unexpectedly—another removal—the subscriber being a shipping firm with two flat rate lines, with separate numbers and no extensions. Here is my time table and result—

Interviewed subscriber at 11.45 a.m., quoted removal charges, suggested private branch service, giving names of similar firms equipped with it and quoted rate. At 12.10 p.m. returned to office, prepared contract, got official letter confirming my quotation, and at 12.50 p.m. contract for five years for two junctions, three extensions and 6,000 calls, signed and completed with full instructions as to position, class of instruments, etc., was handed to the contract manager, the time occupied being one hour five minutes. This incident demonstrated the result of "striking the iron while it was hot," a practice in which I am a great believer, bitter experience having taught me that a little delay has proved fatal in several likely cases.

Of course cases of this kind are exceptional, and must not be expected every day, while others occur in which such expedition would be impossible; nevertheless from personal experience I have founds removals a regular "open sesame" to private branch exchange orders, and would recommend contract officers to take full advantage of them for introducing and pushing the service, especially among large users. My usual practice on receipt of instructions from the contract manager is to ascertain full particulars of the subscriber's actual installation. Possibly it is two lines with separate numbers and one or two extensions on each. Here at once comes the opportunity for suggesting improvement in the service by an amalgamation of the lines under a common number with suitable extensions, giving not only exchange facilities in the various departments of the subscriber's business but establishing a system of intercommunication which in itself is valuable. In such cases the percentage of successes and consequent increase in junctions, stations and revenue has been highly satisfactory.

Take another and apparently less likely case, that of the subscriber with one junction and one extension on the flat rate. He wants a removal with the addition of an extension at his new offices. That man's business must be increasing. Here is another favourable chance which should be quickly taken advantage of, and should bring favourable results to the Company and credit to the contract officer who handles it. Many other instances might be quoted, but the above will I think be sufficient to demonstrate to contract officers that in taking full advantage of removals they will find that there is "something in it."

At this point, while I trust I am not touching upon anybody's susceptibilities, I would suggest that contract managers and their clerical staffs make it a rule to hand all enquiries relating to removals to the man upon whose ground the subscriber is situate. This practice not only assists materially in private branch exchange development, but saves time, postage, and sometimes unnecessary clerical labour, prevents likely mistakes and delay, and keeps the outdoor man in close touch with the subscriber, a consideration not to be overlooked. The contract officer is also posted with the knowledge that there is a probable spare line which he must get "picked up" as quickly as possible, while the "unconsidered trifles" in the shape of private lines, "A" to "B" lines, residence lines and sales orders form no small addition to the Company's revenue.

In the foregoing I have dealt with cases where smart work has been conspicuous, but we now come to the reverse side, those requiring a full course of striking hard and often. Cases of this kind are not occasional, they are frequent, but I have invariably found that with patience, determination and a careful eye on the subscriber's traffic, perpetually advising him of the probable loss of business and inconvenience to customers through ineffective calls, success has been ultimately attained, and success in such cases brings more personal satisfaction than if achieved at the first interview. I have had a number of such cases and I well remember one, that of a local shipping firm whose ineffective calls were very heavy. Negotiations began early in October, 1906, and interviews were very regular up to February, 1907, when I appeared to have made some impression. On the occasion of my next interview the subscribers were taking a record of their calls, and when I paid my next visit, "the idea was out of the question, as their calls were enormous and the cost would be ruinous." A little enquiry

revealed the fact that their record clerk (the office boy) had been booking both outward and inward calls, but he "could not say how many were ineffective." I left on the understanding that another record would be taken and a further appointment arranged.

After waiting some weeks I paid another visit. "Had forgotten to take record, but one of their best customers had written complaining about never being able to get them on the 'phone," and suggested that "they should take the matter up with the National Telephone Company, as it was very annoying when they were wanting a special quotation for freight to be delayed so much."

I expressed no surprise at this, but on the contrary wondered how many of the other "ineffective" calls were of a like nature. and what was the extent of the losses to the subscriber through insufficient lines for their traffic. This settled it, and a few days later an agreement was signed for four junctions, nine internal and five external stations and 18,000 calls, the time elapsing from the first call to the (I was going to say last interview, but this would be wrong, as I am now convincing them that a further junction is necessary for their traffic) signing of the contract being fourteen months.

On March 27 last I completed a private branch exchange contract with a prominent insurance company, with whom negotiations for additional service were opened on June 30, 1906; the secretary has since expressed satisfaction at the vastly improved service, and added a further internal extension to the equipment.

I have still on hand a large number of cases of this kind, and no doubt other contract officers could give similar testimony, but it is possible to settle them eventually by "striking hard and often," as the above results go to prove. Let the contract officer make a point of approaching the heavy user with details showing the inefficiency of his equipment for his traffic. Don't be disheartened if you are unsuccessful at first. The instances of immediate success recorded in this article I consider miracles, as the British public are not yet sufficiently educated for there to be a demand for immediate private branch installation.

Business men are, however, though slowly, surely bound to realise the great development in the telephone service during the last few years, and that improved telephone equipment at the subscriber's end affords better facilities for their customers and consequently a greater development in their business, for which they must provide.

Contract officers should also bear in mind that as commercial men they are on the road handling a commodity which has no rival. It is valuable stock to the man of business, and like some other proprietary articles of trade, though the feeling against "stocking" it may be strong, it must be handled sufficiently to cope with trade and customers' requirements, a fact which business firms and large users are finding out daily and then are surprised they have been so long in making the discovery. In my opinion, contract officers can look forward with confidence to the development of the private branch exchange service as providing a most fertile ground for their success, if they go into their work with energy and enthusiasm, and if the few personal experiences narrated in this article afford them any encouragement or assistance I shall feel well repaid for the slight trouble entailed in penning it.

AWARDS FOR INVENTIONS.

G. H. SMITH, Nottingham, has received an award of £2 10s. 0d. for a contrivance for dealing with cases where arms are on wrong side of pole.

CIRCUMVENTING THE BURGLAR.

PEOPLE who have telephones, says the *Cambuslang Advertiser*, and especially those who live in places attractive to the house breaker, could do worse things than have their servants well up to the use of the telephone, provided such a thing is in the house. It might do a good service to a neighbour, spare an insurance company forking out, and putting under lock and key those who make war against society in general. A case in particular of this happened in the district of Burnside on Monday evening. A servant girl noticed that a strange man had forced an entrance to an adjoining villa. This set her thinking what should be done to circumvent the prowler. She did not set up a hue-and-cry, run into the street shrieking, putting the neighbours agog, as females usually do in such circumstances. This practical Ru'glen girl quietly went to her master's telephone, rang up Inspector Richardson at the police office in the town. Two policemen were dispatched, and got the man inside the house with sufficient articles ready for removal that would keep him in idleness for several weeks when they were put into money. The burglar turned out to be a man who has been off and on in the hands of the police for the last twenty years.

TELEPHONE WOMEN.

XXIII.—MARY ELLEN CAMPBELL.

MISS CAMPBELL entered the Company's service on Jan. 7, 1894, as a part-time operator at Morriston, a sub-exchange to Swansea, which at that time had twenty subscribers, two junctions and a trunk line to Neath. Miss Campbell has naturally seen many changes. At that time the exchange was only open from 9 a.m. to 6 p.m.; the subscribers' circuits were mostly single; and the board was of the old slipper pattern with suspended Blake transmitters. To fill up time she used to repair her own cords. As an example of the way in which history repeats itself, it may be mentioned that tickets for trunk users were then in use for recording calls.

In 1899 Miss Campbell was brought into Swansea as trunk junction operator, there being sixteen junctions to the Post Office. Now there are 48. There were about 300 subscribers on single and metallic circuits, the staff consisting of six operators and a clerk-in-charge. The subscribers now number 1,560; there are 153 junctions, a heavy calling rate and junction traffic, and an operating

MARY ELLEN CAMPBELL.

staff of 23 operators, one supervisor, one clerk-in-charge and one exchange manager.

Miss Campbell was appointed Supervisor in 1903, which year saw the inauguration of the Municipal Telephone Exchange, since when the whole Swansea staff, and the operators in particular, have had a very strenuous time, but despite all difficulties a splendid service has been maintained, Swansea claiming to be at the top of the list for operating magneto call-and-clear exchanges, and only second to Brighton with a more modern board. In achieving this position Miss Campbell can claim a big share by her example, tact and leadership of an intelligent and loyal staff.

In 1906 an exchange manager was appointed and the clerk-in-charge's position left vacant, but owing to increase of work and the absorption by the Company of the Corporation system, Miss Campbell was in 1906 appointed Clerk-in-Charge of the Central Exchange.

Miss Campbell has served under several managers. She is respected by the subscribers, and can certainly give them that soft answer which turneth away wrath. Her pride in her work is

reflected in the staff under her. She is proud of being the first secretary of the first telephone operators' society in the Kingdom, in the inception of which she had a great share.

Although the work at the best must be of a trying nature, Miss Campbell generally manages to keep a smiling face and the best of tempers, and confesses that had she her time to go over again would without doubt choose the same course. She confesses to no particular hobby other than her work and the welfare of her staff, except perhaps tennis, and must be congratulated on attaining a position she so worthily fills with credit to herself and advantage to the Company.

XXIV.—JANET TAIT.

MISS JANET TAIT was born at Bury in Lancashire on June 9, 1881, and came to Nottingham with her parents when about three years old. She was educated first at a private school, and then at the Huntingdon Street School, Nottingham. In February, 1897, at the age of sixteen she was appointed to the Carrington sub-exchange within the city of Nottingham, which was worked with two full-time and one half-time operators. This small exchange was closed in July, 1901, and the operating staff was transferred to the Nottingham Central Exchange. On her transfer to Nottingham Central Exchange Miss Tait received early promotion, and was made Senior Operator in November, 1902. About a year after this date she went to Derby Exchange to take charge temporarily. Shortly afterwards the supervising staff at Nottingham, which consisted of one, was increased to two, and Miss Tait

JANET TAIT.

was given the appointment. Soon after this the senior supervisor resigned, and Miss Tait was appointed to the premier position. In December, 1905, the then clerk-in-charge resigned, and Miss Tait was appointed in her stead. When she first commenced her work at the Nottingham Central Exchange there was a staff of about 24 operators, which has increased to one monitor, four supervisors and 37 operators. Miss Tait carries out her duties with tact and ability; the operating has improved in a very marked degree during recent years, due in a great measure to her efforts. She takes a keen personal interest in each member of her staff, and is a firm believer in maintaining social relations between them.

It was originally intended for Miss Tait to adopt a musical career, as when five years of age she commenced to learn the violin, and most of her spare time was given to the study of the instrument. She has passed several examinations. In fact, shortly after Miss Tait commenced at Carrington Exchange she was offered an engagement in a ladies' orchestra to travel abroad, and had in fact made all the necessary arrangements, but was suddenly taken ill with pneumonia, which was of such a serious turn that all thoughts of the tour had to be given up. This was at the time a great disappointment to Miss Tait, as she is extremely fond of travelling, but she now says that she looks on her illness as a blessing.

REDISTRIBUTION AT THE BRISTOL EXCHANGE.

BY A. E. COOMBS, *Exchange Manager.*

THERE has just been completed at the Bristol Exchange a redistribution of 3,000 lines which had been rendered necessary by the overloading of the old positions owing to rapid development, the new sections of the board not being quite ready to take these additional lines. Perhaps it would be as well to explain to readers of the JOURNAL that the meaning of the word "distribution" as applied in this article is that the position of each subscriber's answering jack and line signal has been changed, and this change so arranged and ordered that as nearly as possible each operator at the board shall have an equal load, quite irrespective of the position occupied. These changes were made by means of the "intermediate distributing frame" in the testroom, on which lines coming from the main frame can be so cross-connected that they can be terminated on any position, independent of numerical sequence.

The following factors had to be well considered at the outset:—

A. All position loads must be equal.

B. Night traffic must be concentrated.

C. Automatic box lines must be concentrated.

D. Carrying out of scheme must not interfere with the service or dislocate traffic in any way.

There were, of course, many more axioms, but the above were the most important.

CALLING RATES.

After ascertaining the usual facts and figures as to the calling rates (average number of calls per day) of the various classes of lines, flat rate, party, measured, etc., it was decided to analyse the figures and divide and subdivide the different classes of lines.

To do this the following method was adopted. Nine of the senior staff of the exchange (including three supervisors) were asked the following question:—

"What numbers do you consider the busiest in the exchange?" Please note 100 in each of the columns provided, in numerical order.

1 to 500.	501 to 1,000.	1,001 to 1,500.	1,501 to 2,000.	2,001 to 2,500.	2,501 to 3,000.
2	501	1,002	1,505	2,003	2,502
4	505	1,042	1,585	2,040	2,543
5	509	1,053	1,601	2,046	2,556

It was understood that if in any column 100 busy numbers could not be recorded, as many as possible should be noted, or if in anyone's opinion there were more than 100, as many as necessary were to be indicated. The idea was that by separating the numbers into blocks of 500 a more effective opinion would be obtained (concentrated on each 500 yet distributed over the whole exchange) than if, say, the 600 busiest numbers of the exchange had been asked for.

Each of these nine papers was made out independently and when all were complete there were in the aggregate over 1,000 lines recorded as busy; there was a large number upon which there was an agreement of opinion as to calling rate, there were many lines about which there was a difference of opinion, and again there were many not mentioned at all. It was the lines on which there was a difference of opinion which ran up the total, for what one senior would consider a busy line another would not, and so, although the lists did not often contain more than 100 numbers in each column, yet collectively they averaged many more. At any rate, the selection of lines made by the exchange staff signified to the management that these lines were to a greater or less extent busier than the rest, which it was only right to assume did not call for first consideration in the redistribution, but could be used for filling the spare jacks on each position after the "busy" numbers had been allocated to their proper positions; the reason for this assumption was that it was practically impossible for the whole nine

operators to omit a really busy line; therefore, if the numbers noted were distributed evenly, the filling in of those not noted should not affect the evenness of the load in any way.

This completed the first stage, but so far the busy numbers had only been noted in a general way.

There were numbers now known to be busy, but there was nothing to show the degrees of "busyness." For example: If No. 2 had been noted as a busy number by all nine observers there would not be any doubt but that No. 2 was a busy number, but if on the other hand No. 2 had been noted by only three out of the nine, then the assumption was that he was only comparatively busy.

To arrive at a classification, therefore, a summary of all the sheets was made, No. 1 sheet being taken first and all "busy" numbers appearing thereon were marked with one vote on the summary as shown below (abridged)—

Nos. 1 to 500.

122 /	126	130	134
123	127	131	135
124	128	132 /	136
125 /	129	133 /	137

No. 2 list was then taken and all numbers thereon were similarly marked, if any line appeared here that was not on No. 1 list it would of course get its first vote, if the same numbers appeared they would receive additional votes. So that after No. 2 list had been dealt with the summary sheet appeared thus (abridged)—

Nos. 1 to 500.

122 //	126	130	134
123 /	127	131	135
124 /	128 /	132 //	136
125 //	129	133	137

The same process was gone through with all papers and at the completion of the ninth the summary sheet appeared thus (abridged)—

Nos. 1 to 500.

122 /// ///	126 /	130	134 //
123 /	127	131	135
124 /	128 /	132 /// ///	136
125 /// ///	129	133 ///	137

The relative "busyness" is denoted by the number of votes against each number.

The next step was to take an abstract from this summary and grade the various numbers according to the number of votes received; for the purposes of this grading the voting was grouped, eight and nine votes being taken as of equal value, six and seven ditto and so on. The column below shows the result of this abstract—

Lines receiving	8 or 9 votes	...	120 busiest numbers.	
,, ,,	6 or 7 ,,	...	162 busy	,,
,, ,,	4 or 5 ,,	...	208 less busy	,,
,, ,,	1, 2 or 3 ,,	...	750 fairly busy	,,
	Total		1,240	

A total of 1,240 busy lines out of 3,000 seems to leave a lot unaccounted for, but it must be pointed out that the remaining 1,760 included some 800 measured rate and 670 party lines, having comparatively low calling rate; then there were some flat rate lines with low calling rate. So allowing for these, it will be seen that the process of classification outlined had reasonably dealt with the sifting and grading of the busy lines.

The nucleus of the scheme had now been obtained; the next thing was to distribute the lines proportionately.

There were 3,000 working lines; the answering equipment was 60 lines per panel, therefore 50 panels were required. If then there were 120 "busiest" numbers it is obvious that with 50 panels there should be approximately two and a half of these "busiest" numbers to each panel (or five to every two panels); with 162 busy numbers, three should be allotted to each panel; and so on until all the lines enumerated had been allocated to their proper sphere, the quiet lines (measured and party) being used to complete the panels.

The next question to decide was as to the positions on the panels that the busy numbers should occupy. This may seem a trivial matter, but as every detail had to be considered in the sorting out of the numbers, so it was felt that the positions on the panels allotted to the busy lines should be carefully considered. For instance, it has just been mentioned that five "busiest" numbers had been allotted to every two panels; would it not be advantageous to put these numbers on alternate and not on adjacent jacks? If their calling rate was high would not the operator be better able to plug into a jack removed by one or more from one already occupied? Everyone connected with telephone traffic will confirm the statement that it is much more difficult to plug into a jack when the adjacent jacks are plugged up than when they are free.

Another point for consideration was whether the operators could not more easily plug into the top rows of jacks than the bottom rows, and it was observed, and confirmed by some personal testing, that there was a decided tendency to favour the top. Why this should be cannot very well be shown in statistical form, but there it was and it was taken advantage of.

So far then the busy numbers had been classified and allotted to various positions on alternate jacks, working downwards. Below is given a panel in its various stages of occupation.

Stage 1.—"Busiest" numbers only.

No. 50	o	o	*	o	o	o	*	o	o	o	No. 59
,, 40	o	o	o	o	o	o	o	o	o	o	,, 49
,, 30	o	o	o	o	o	o	o	o	o	o	,, 39
,, 20	o	o	o	o	o	o	o	o	o	o	,, 29
,, 10	o	o	o	o	o	o	o	o	o	o	,, 19
,, 0	o	o	o	o	o	o	o	o	o	o	,, 9

Stage 2.—"Busiest" and "busy" numbers.

No. 50	o	o	*	o	*	o	*	o	o	o	No. 59
,, 40	o	*	o	o	o	o	o	*	o	o	,, 49
,, 30	o	o	o	o	o	o	o	o	o	o	,, 39
,, 20	o	o	o	o	o	o	o	o	o	o	,, 29
,, 10	o	o	o	o	o	o	o	o	o	o	,, 19
,, 0	o	o	o	o	o	o	o	o	o	o	,, 9

Stage 3.—"Busiest," "busy," "less busy" numbers.

No. 50	o	o	*	o	*	o	*	o	*	o	No. 59
,, 40	o	*	o	*	o	*	o	*	o	*	,, 49
,, 30	o	o	o	o	o	o	o	o	o	o	,, 39
,, 20	o	o	o	o	o	o	o	o	o	o	,, 29
,, 10	o	o	o	o	o	o	o	o	o	o	,, 19
,, 0	o	o	o	o	o	o	o	o	o	o	,, 9

Stage 4.—"Busiest," "busy," "less busy," "fairly busy."

No. 50	*	o	*	o	*	o	*	o	*	o	No. 59
,, 40	o	*	o	*	o	*	o	*	o	*	,, 49
,, 30	*	o	*	o	*	o	*	o	*	o	,, 39
,, 20	o	*	o	*	o	*	o	*	o	*	,, 29
,, 10	o	o	*	o	*	o	*	o	*	o	,, 19
,, 0	o	o	o	o	o	o	o	o	o	o	,, 9

* Denotes jacks taken.

All the spare jacks left after this were filled up with quiet lines, and it may be remarked here that although the two-party line flat calling rate was ten per day (five per subscriber) as compared with twelve for the direct flat rate lines, very few of the former could be termed "busy" lines, the explanation being that their traffic was more or less uniformly distributed throughout the day and was not so concentrated to business hours, this incidentally proving that to take an average calling rate figure only for the distribution of traffic would be misleading.

Due regard was also paid to the intermixing of measured with flat rate lines; these former were, with few exceptions, to be counted amongst the "quiet" lines, so that where mixed with flat rate they always occupied bottom rows of jacks. There was one factor to be taken into consideration here, viz., the decreased capacity of an operator dealing with measured rate calls, owing to her having to work off all engaged calls and to record all special junction calls (call registers are being used for recording ordinary calls); after a careful calculation based upon the junction traffic and engaged or ineffective traffic a percentage of five was allowed for these factors. For every 100 calls (valued) dealt with by an operator dealing with flat rate traffic only, the operator dealing with mixed services should deal with 95. So far this has worked admirably.

Then again the call offices, automatic boxes and ten-party lines had to be distributed. It was very necessary (especially with automatic boxes) that these should be localised and not be intermixed with flat rate lines. It was found, however, that these services could be distributed between themselves—a distribution within a distribution—so taking them alone (about 210 in all, including 150 boxes) at three "A" positions they were so distributed that each of these three operators had a equal load, also equal to that of the other "A" positions. The spare jacks left were taken up by ordinary measured rate and residence lines.

So far, then, the positions of all lines had been decided. The following records were therefore made :—

"A."—A numerical record of all lines, giving existing position and position to be transferred to. Below is an abridged copy.

No.	Now on		To be moved to	
	Panel.	Jack.	Panel.	Jack.
1	20	26	75	37
2	36	10	74	40
3	22	20	40	56
4	38	52	41	52
5	17	36	74	41, etc.

"B."—A complete list of all panels to be filled, and with what numbers.

Panel 84.

Jack.	Subscriber.
50	459
51	613
52	469
53	746
54	470
55	1,204, etc.

So that whether a number or a panel had to be referred to it could be easily found, and as the numbers were allocated on list "B" so they were marked off on list "A," as, of course, the redistribution scheme was built up in panels and *not* numerically.

The scheme was now ready for the actual cross-connecting, and the next point to watch was that during the process of cutting over no one should be inconvenienced—the subscriber by being disconnected or the exchange by undue dislocation of traffic; to keep as close a check on this as possible, the following method was adopted:—

Two couples of electricians were appointed to carry out the scheme on the intermediate distributing frame, one of each couple taking the horizonal side, the other the vertical side of the frame. To each of these was given a copy of list "B" before mentioned, a panel at a time, and each couple of men was kept working on alternate panels, one taking the odd the other the even numbers; this was necessary to prevent overlapping and interference on the vertical side of the frame—for it is obvious that two men could not work together on one set of tabs. A panel at a time, as previously mentioned, was given to each pair and this panel (containing 60 jacks) was subdivided into lists of ten, a list for each row of jacks, each list being numbered in the right-hand corner as below—

No.	From	To
1	20—26	75—37
2	36—10	74—40
3	22—20	40—56
4	38—52	41—52

No. 1.

As each ten cross-connections were completed the list was returned to the exchange, where every line changed was immediately tested, the opals and number plates checked and the new panel and jack book entered up. If any fault was found the list was immediately returned and the cross-connection traced, and if faulty put right at once, the work in hand being stopped for this. By this means the chances of subscribers experiencing trouble or the exchange being inconvenienced were reduced to a minimum.

It was really much quicker to do this work than it has been to illustrate how it was done. By these methods the whole scheme was carried out smoothly; when every ten lines were checked there could be no accumulation of work or leakage between test-room and switchroom. The records were built up and the staff changed gradually until at the end of the work the whole aspect of the exchange and the conditions of traffic had been altered, yet no one could point to any definite time when the change occurred, or —one could almost say—when it was occurring.

It is also a matter for congratulation that no complaints were received from subscribers traceable to the distribution; of course there were some faults, but these were of a minor nature or were remedied before the subscribers knew of them. Immediately the cross-connections had been completed, over 800 call registers were joined up on the intermediate distributing frame to the measured rate lines—these being brought into use satisfactorily on June 1 last.

HE ORDERED AN EXTENSION SET.

A STOUT elderly citizen of Toronto was alone in his house one evening, reading in his den in the third storey, when he heard the bell of his telephone on the ground floor ring merrily. There was nothing for it but he must go down and answer the call, as it might be important.

But it was not. It was a young woman speaking and she had got the wrong number. The stout man was not pleased, and he said so very plainly. "You've brought me down two flights of stairs," he said. "You've brought me down two flights of stairs for nothing. Now I've got to climb up there again. You should be more careful—get the right number before you call anybody up. People are *altogether too careless. To a man weighing nearly two hundred and fifty* pounds climbing up and down stairs is no joke. I'll ring off."

"I'm very sorry," came the voice of the young lady over the telephone.

"You ought to be—you ought to be," he replied, and back up the two flights of stairs he clambered heavily, conscious that he had done his duty.

No sooner had he got comfortably settled at his book again, however, when the telephone rang again. He glared. But that did not help it any. Still the bell rang its imperative demand. Down he went again, and to his surprise he heard the young woman's voice.

"Excuse me," came her apology, "but are you the gentleman to whom I was speaking a moment ago?"

He was.

"Well, I have been thinking over what you said to me, and an idea occurred to me which I thought I would mention to you. If you weigh nearly two hundred and fifty pounds, perhaps going up and down stairs would really do you good—don't you think?"

Then she rang off and left him standing there alone in that great house, without a living soul to hear the words he said.—*Toronto Saturday Night.*

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
TELEPHONE HOUSE, VICTORIA EMBANKMENT LONDON, E.C.

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TRAFFIC.

IN the article on American telephone methods, from which we quote some passages in another part of this issue, Mr. LAWS WEBB perhaps puts the matter rather high when he says that "the traffic is a telephone administration's whole business, or very nearly its whole business." The "very nearly" cautiously saves the situation, and perhaps may be held to cover such items as construction and maintenance. But if we look at the matter from the point of view of the telephone user, Mr. WEBB's *dictum* appears truer than some branches of the staff would at first be disposed to admit. Certain it is that without good construction and good maintenance the traffic cannot flow with regularity, but the impatient subscriber recks nothing of that; he takes good construction and maintenance for granted, and he judges the whole telephone business by the service—the rapid and accurate flow of the traffic.

It is very easy to see why this should be so, although we fear that all telephone men and women do not steadfastly recognise that it *is* so. The telephone user is no judge of the mysteries of switchboards, of lines, cables, dynamos, accumulators, insulators and conductors; he even knows his instrument so little that he frequently calls the transmitter the "receiver"—*vide* any daily paper. But he is a judge of speed and accuracy, and when he goes to the telephone he wants speed and accuracy, and nothing else. (We need not here specify good transmission, because that, like good construction and maintenance, is taken for granted; without it the rest goes for naught.) Instantaneous communication is the essence of the telephone service, the very reason for its existence, but instantaneity without accuracy is of no use, because inaccuracy means a complete failure of the particular transaction. If the subscriber's call is delayed, he is annoyed; if it is spoilt by an error, he is infuriated. On the other hand, if it goes through well and quickly he has a sense of satisfaction, not as lively as the sense of dissatisfaction caused by delay or error, but which still has its cumulative effect in influencing the subscriber's good opinion of the service and in encouraging him to use it freely.

Therefore from the subscriber's point of view the traffic is the whole thing, and unless we handle our traffic accurately, smoothly and quickly, the rest of our work is more or less purposeless. There is no slur here on the varied and highly responsible efforts which are involved in the organisation and conduct of a great telephone system. A moment's reflection shows that all efforts must eventually focus on the subscriber, who provides the wherewithal to keep the entire system going. His judgment is based for all practical purposes exclusively on the service, on the efficiency or otherwise of the conduct of the traffic. Construction matters, maintenance matters, contract matters, wayleave matters, accounting matters, affect his judgment of the efficiency of the organisation only indirectly and more or less incidentally. But traffic efficiency concerns him most directly, and daily and hourly throughout the year. Which goes to show how great is the responsibility of the Traffic Department, and of every member of it.

THE TELEPHONE AND THE ARTIST.

THE topical black and white drawing of to-day, when it represents an interior, is scarce reckoned complete without its telephone. And it may here be remarked that the telephone has been infinitely more lucky in its artists than other inventions which have played a large part in the public view, and more especially the locomotive. It took the artist some 70 years to learn to draw a locomotive. Anyone turning over the pages of old illustrated papers will be struck by the monstrous barrels uncomfortably perched upon wheels, adorned with a towering chimney and a jam pot by way of steam dome, and wreathed about with a few superfluous pipes to hide the barrenness of the draughtsman's knowledge, which did duty for a representation of a locomotive in the 'seventies and 'eighties. The picturesque side of the railway, of the train in motion, has in general failed to attract the attention of the artist—with the notable exception of TURNER'S extremely "impressionist" "Rain, Steam and Speed on the Great Western."

The telephone has secured a more fortunate treatment. With its increasing prevalence in civilised life the artist has become familiarised with its shape. Our magazines and comic papers teem with quite respectable common battery sets, and when the hand-microtelephone was in vogue it was generally passably drawn. There were days in the 'eighties, it is true, when men were portrayed indifferently listening at or shouting down strange cylindrical pots at the ends of cords, but the receivers and transmitters of those days were so various and of so transient a life that it would require considerable expert knowledge of early telephony to convict the artist of wrong. Of course, a telephone is but a detail in the composition and arrangement of a picture, and a photographic exactitude is not to be looked for; nor is it desirable, if such detail is to be kept in its proper key. But there are certain deviations from the actual which are not excusable and are often profoundly irritating in a picture, and in this connection we think the telephone has been well served by the brush and pencil.

THE GIANT TELEPHONE EXCHANGE.

WE learn from an article in the *Zeitschrift für Schwachstromtechnik* that what it calls the "giant telephone exchange" has not proved a success in Germany. One of the peculiarities of the management of the telephone by the German Post Office has been to evolve a telephone practice of its own, a conspicuous feature of which has been the construction of very large exchanges; in Berlin exchanges of 20,000 lines and 30,000 lines have been built, and in Hamburg one with an ultimate capacity of 80,000 lines is in course of construction. It now appears that the experience of the Imperial Postal Administration with the large exchanges in Berlin has not been satisfactory as regards service, supervision and cost. It is said that not only are such exchanges "unpractical," but they are also financially unsound, "as their costs do not keep pace progressively with their increase in size, but verge towards the immeasurable!"

It is suggested that a programme of decentralisation will shortly be adopted in Berlin, which will be assisted by the adoption of call-wire working of junction lines, which has not yet been a part of German telephone practice. It is anticipated that the working of the mammoth Hamburg exchange, which is expected to be in service some time next year, will give interesting and practical information on the question of centralisation or decentralisation.

There are so many local factors to be considered in planning a large telephone exchange for any given place that it is not easy to say that any particular size of switchboard is fundamentally wrong or right, but since the telephone service has to be conducted by means of numbers the question of numbers is a general factor of much importance. The difficulty in dealing with numbers containing five digits is no light one; in fact, it is such a serious matter, when all the requirements of rapid and accurate service in a great city telephone system are considered, that it practically puts the exchange of over 10,000 lines out of court. The difficulty in correctly transmitting numbers by telephone has evidently impressed our German contemporary, as it qualifies five as a "telephonically impossible number."

ANSWERS TO QUERIES.

LONG-DISTANCE TELEPHONY.

A MANCHESTER correspondent, who signs himself "Learner," sends us four questions on long-distance telephony, as follows:—

1. How far has a telephone message been sent—either experimentally or otherwise?

2. How far and with which most distant towns is conversation carried on, at the present time, from Manchester, Liverpool, London or any of our large towns in England?

3. How long has Continental speaking been going on from England?

4. How long (approximately) does it take to get through from Manchester to the towns asked about in question 2.

With regard to question 1, we understand that commercial talking is carried on in America over distances of upwards of 1,600 miles; not long ago a letter was published stating that the writer, in Omaha, spoke daily to his agent in Boston over a line of more than 1,600 miles. That experimental talking over even greater distances has been done in America is quite probable, though we have no record of such experiments; but at the present time the great trunk line system of the American Telephone and Telegraph Company is being extended to Denver, which is 1,930 miles from New York and 2,150 miles from Boston, so it seems likely that commercial talking is now deemed possible between points over 2,000 miles apart. This is a striking illustration of the progress of telephony.

As to question 2, Manchester, Liverpool and London can talk with any town in the United Kingdom which is connected to the trunk system. Thanks to the Glasgow-Belfast telephone cable, Ireland is also within speaking distance, and we believe that conversation between Cork and London, *viâ* Belfast and Glasgow, a distance of well over 700 miles, is not uncommon. The actual distances over which telephonic communication is required in Great Britain offer no difficulty; the man in Manchester can talk to any corner of the kingdom, provided that the lines, cables and connections are up to their work. "Continental speaking" began with the establishment of the London-Paris line, for which a special telephone cable was constructed in March, 1891. A few years ago a telephone cable was laid between England and Belgium and a direct telephone line established between London and Brussels in 1903. According to the *Post Office Guide*, communication would appear to be available between Liverpool, Manchester and Bradford and Marseilles, a distance of over 1,000 miles.

Question 4 touches on a delicate point, and our correspondent was well advised in qualifying his query by that charitably parenthetic "approximately." It is difficult to say, even "approximately," how long the average trunk call takes in this country. It may take ten minutes, and it may take an hour or even two.

IF you want to be miserable, think about yourself—about what you want, what you like, what respect people ought to pay to you and what people think of you.—CHARLES KINGSLEY.

OPPORTUNITY.

"THEY do me wrong who say I come no more,
When once I knock and fail to find you in;
For every day I stand outside your door,
And bid you wake and rise to fight and win.

"Wail not for precious chances passed away;
Weep not for golden ages on the wane;
Each night I burn the records of the day;
At sunrise every soul is born again.

"Laugh like a boy at splendours that have sped;
To vanished joys be blind, and deaf and dumb,
My judgments seal the dead past with its dead,
But never bind a moment yet to come."

—Judge WALTER MALONE.

THE NATIONAL TELEPHONE STAFF HOSPITAL COLLECTIONS (LONDON).

THE collections for the quarter ending June 30 have maintained the increase of the previous quarter, and amount to £174 0*s.* 5*d.* The letters issued show an increase of 25, numbering no less than 161, made up as follows:—Dental letters (private dentists), 56; dental hospitals, 7; women's hospitals, 2; children's hospitals, 8; general hospitals, 11; skin hospitals, 3; chest hospitals, 12; eye hospitals, 12; ear, nose and throat hospitals, 17; dispensaries, 6; convalescent homes, 11; surgical appliances (including spectacles), 10; specialists' advice at half-fees, 2; Epilepsy and Nervous Diseases Hospital, 2; Orthopædic Hospital, 1; Diseases of the Heart Hospital, 1.

These have been distributed among the following departments:—Electricians, 25; Contract, 3; Engineers, 25; Metropolitan Office, 21; Construction, 8; Traffic, 49; Stores, 4; Head Office, 21; Workshops, 4.

A letter was also issued in a specially necessitous case, outside the Company's staff, which was brought to the notice of the secretary.

The hon. secretary is shortly issuing detailed announcements of courses of lectures in first aid, under the auspices of the Hospital Saturday Fund Centre of St. John's Ambulance Association, for both sexes, the fee for each course being 2*s.*, and for the necessary text book 1*s.* As these are greatly reduced fees it is hoped that many members of the staff will avail themselves of the opportunity of acquiring knowledge which must be exceedingly valuable, and might at times prove especially useful to engineers in the event of an accident occurring at some distance from a hospital or medical man.

It should be remembered that wherever there is a person qualified to render first aid in any exchange or department of the Company of not less than 25 subscribers contributing to the Hospital Saturday Fund not less than £5 per annum, a fully equipped ambulance box will be supplied free of all cost, that already issued to Salisbury House, London Wall, under the charge of Mr. Roger Payne having been found of very great help on several occasions.

HONOUR WHERE HONOUR IS DUE.

THAT eminently sane and conservative financial journal, the *Statist*, in an article dealing with the continued progress of the National Telephone Company, gives a very pointed account of the various difficulties—so generally overlooked by the Press—with which the Company has had to contend, as follows:—

The life of the National Telephone Company, Limited, is drawing rapidly to a close, as on December 31, 1911, its licence will expire and its business will be taken over by the State. The process of dissolution, however, does not appear to affect the Company's progress adversely in the slightest degree, and, as if unconscious of its doom, the Company continues to extend its business and increase its profits. It was naturally thought likely, when the Post Office set up a rival service in London, that the usefulness of the Company would at any rate be curtailed, and the probability is that few people generally would have been surprised had the profits shown signs of shrinkage. But, as in other cases, so it has been in the case of the telephone industry, private enterprise well equipped, well managed both from a technical and financial point of view, and well organised, has always been able to compete with at least equal success with a Government department, even when conditions of competition have been unequal. And in the considerable amount of attention that is given nowadays to the various problems of municipal enterprise, of the advantages and disadvantages of individual initiative *versus* the State, it must not be forgotten that it is to individual enterprise the country owes its present proud position. And while there are, undoubtedly, enterprises which the municipalities of our country and the State as a whole are best fitted to undertake, nevertheless, it will be a bad day for the country as a whole should the time ever come when individual initiative and enterprise will be tabooed and the whole of the industries of our country be turned into what would practically be a huge civil service. For the history of the telephone in London during the last few years goes to prove that a private company, even though it is sadly hampered by conditions from which the Post Office have been free, is more than able to hold its own, and, in spite of competition by a Government department, is able to increase its own business, the profits earned, and dividends paid.

This might be considered very satisfactory were the conditions on all fours, but such, it is needless to say, is not the case. The Government department possesses powers denied to the private company, but beyond this, in the case of our telephone service, the private company is taxed to add to the revenues of the competing Government department. Was there ever such a Gilbertian situation elsewhere? Of course, in the long run the profits of the private Company are unaffected, inasmuch as the tax of 10 per cent. on the gross takings of the National Telephone Company which has to be handed over to the Post Office falls on the telephone users, and so to help the Post Office to pay its way an addition of 10 per cent. is made to the charges which the National Telephone Company makes to the users of the telephones. In other words, were it not for the unfair tax levied by the Post Office the users of the telephone would only have to pay 90 per cent. of the present charges. In spite of this, however, the National Telephone Company, as pointed out, continues to make good progress, and the progress is even greater than that made by the Post Office. In the brilliant and otherwise very fair speech made by the Postmaster-General on the Post Office vote in the House of Commons on Thursday, July 16, Mr. Sidney Buxton was hardly quite ingenuous in his reference to the National Telephone Company. Mr. Buxton said, "From time to time complaints are made to me that the National Telephone system is not always quite as effective as it ought to be, and that sometimes more calls are charged for than have been made. I need hardly say that the complaints made as regards the Post Office system are necessarily much less than those made against the National Telephone system, *because the Post Office system is much the better system of the two.*" The italics are ours. Mr. Buxton omitted to point out that the Post Office system was much the newer of the two. And he also forgot to add that facilities enjoyed by the Post Office are not accorded to the National Telephone Company.

NATIONAL TELEPHONE PROGRESS.

DURING last month new exchanges were opened at Elderslie in the Greenock district, Selsey (Sussex), Leixlip (Dublin), East Linton (Edinburgh), Strathpeffer (North of Scotland) and Knock (Belfast), making a total now working of 1,520; 1,780 new stations were added during July, bringing the total to 465,649.

Edinburgh.—Work is now proceeding in connection with the opening of a new exchange at West Calder.

A start has been made with the work of extending the central switchboard by 2,060 lines, which will bring the capacity of the exchange up to 7,360 lines.

A complete fire and emergency alarm system is being installed at Telephone House.

Luton.—The underground work is nearing completion; 3 miles 495 yards of cable has been pulled in and fifteen distributing poles are completed.

Maidstone.—A 420-line common battery switchboard has been fitted at Maidstone exchange, and the service was changed over from the old to the new system on Aug. 5.

PRIVATE BRANCH EXCHANGE WORK.

One of the most important newspaper offices in the Sheffield district has recently given an order for eleven junctions and 26 extensions. Two trained operators are being supplied by the Company. In Glasgow one subscriber has taken four junctions and 72 stations at the new rate. At Chester Messrs. Summer & Son, a large firm of ironfounders, have taken four junctions and 59 stations. The Junior Army & Navy Stores at Aldershot have taken four junctions and thirteen extensions. In Bradford the *Daily Observer* has taken two junctions and twelve stations, and all the newspapers in the Bradford district are now subscribing at the private branch exchange rate. The Bolton Co-Operative Society is subscribing for 49 stations. The system will include all the branches and the central office. Two switchboards are provided with special change-over switches to enable this system to be worked from one of the departments when the main office is closed. At Swansea, Cameron Hotel has taken two junctions and five stations; Messrs. John S. Brown & Co. have taken two junctions and three stations, and Mr. L. T. Ballin has taken two junctions and three stations.

Leicester.—A 600-line section of the Ericsson type (combined jack and indicator) has recently been fitted, and an extension of Post Office junction and local junction boards has been made. A power plant comprising a mercury arc rectifier, a set of eleven accumulators S.L.I., and a Western Electric motor generator have also been installed.

Extensions to existing switchboards have also been made at Market Harborough, Hinckley, Wigston, Anstey, Stamford, Narborough, Burton-on-Trent and Ashby-de-la-Zouch.

FOREIGN INTELLIGENCE.

Germany (Berlin).—The number of telephone stations in the postal district of Berlin as at July 1 was 131,618. The six exchanges in Berlin proper account for 98,613, Exchange VI having 24,313 lines, Exchange I 18,692, and Exchange IV 17,562. Charlottenburg has 13,814, Wilmersdorf 5,596, and Rixdorf 2,580 stations. In all the number of direct lines is 78,710, and of extension stations 46,190.

Switzerland.—The number of telephone stations has increased from 60,380 at the end of 1906 to 64,953 at Dec. 31 last. The largest systems are Basle with 5,357 stations, Berne with 3,494, La Chaux de Fonds 1,417, Geneva 6,102, Lausanne 2,759, Lucerne 1,741, Neuchatel 1,004, St. Gall 2,508, Winterthur 1,099, and Zurich 8,994. The length of lines in kilometres increased from 16,980 to 17,573, and of wires from 273,162 to 291,214.

America, United States.—The following is the development in stations of the Bell Telephone Company in the principal American cities at the end of 1907:—New York 309,282 (or 7·5 telephones per 100 inhabitants), Chicago 156,079 (7·3), Philadelphia 101,404 (6·9), Boston 100,798 (7·5), St. Louis 42,297 (5·9), Pittsburg 39,013 (7·3), Cincinnati 37,861 (8·6), San Francisco 35,980 (10·3), Baltimore 33,627 (5·9), and Washington 30,701 (9·2).

TECHNICAL COLLEGE EXAMINATIONS, BRIGHTON.

THE following members of the staff have passed the examinations at this College, being a good proportion of the total number taking up the subjects. The result is very encouraging and shows a great interest taken in the work by the staff.

Name.	Subject.
H. Martin ...	Practical mathematics, stage 1, second class.
„ ...	Magnetism and electricity, stage 1, second class.
F. Ware ...	Practical mathematics, stage 1, second class.
E. Parsons ...	„ „ „
„ ...	Magnetism and electricity, stage 1, second class.
H. Leney ...	Electrical engineering (preliminary).
„ ...	Electric light wiring, stage 1.
W. Goulden ...	Telephony, honours, first class.
„ ...	Electrical engineering (preliminary).
„ ...	Telephony, ordinary, first class.
C. H. Davidson	Electrical engineering (preliminary).
„	Telephony, honours, second class.
„	„ ordinary, second class.
F. H. Chaplin	Electrical engineering (preliminary).
„	Magnetism and electricity, stage 1, second class.
„	Telephony, ordinary, second class.
W. Jenkins ...	„ „ „
„ ...	Magnetism and electricity, stage 1, first class.
J. Gambier ...	„ „ „ second class.
P. C. Langridge	Telephony, honours, second class.
„	„ ordinary, 1st class.
F. Crease ...	„ „ second class.
P. Hart ...	„ „ „
B. Waters ...	„ „ „

A STRAIGHT WORD TO THE MOST JUNIOR MEMBERS OF THE STAFF.

BY A. M. WATT, *Cashier, Glasgow.*

YES, boys, it's you I mean; for it isn't so very many years since with much nervous anxiety I myself was interviewed by a local manager as to my capabilities and especially my knowledge of the decimal system. He was apparently satisfied, for I got the position of office boy and felt an indescribable glow of independence at the prospect of a weekly wage of five shillings.

I suppose you all, more or less, feel proud when on leaving school you start to help to "keep up the house" with your own earnings, and a very creditable spirit it is. There is one danger, however, that must be striven against, and I should think that if you are really ambitious you cannot help feeling at times that copying and indexing letters, delivering accounts and running errands is hardly the kind of work you expected, and you feel capable of better things. Quite right, too; but, you see, nobody knows that but yourself at the start, and if you show that in the humble but none the less necessary position of office boy you are earnest, reliable and thorough, you will not have to wait long before a job higher up is open to you.

There is a book you ought to ask your father to get for you, which is chock full of hints as to the conduct and methods which will make a success of your career. I refer to *Letters from a Self-Made Merchant to his Son*, by G. H. Lorimer, and it isn't a "preachy" book in the least, but quite one of the funniest I have ever read. Get it now, read it and then read it again.

If you should happen to start in a large office where there are a few other boys don't fall in with everything they want you to do but strike out a line for yourself from the very start, so that when the paper football goes through the office window (and it always does, sooner or later) there will be no fear of *you* being involved.

Of course you want to learn as much of the telephone business as possible, and by using your ears and eyes and asking as many questions as you reasonably can during the day and attending to your classes in mathematics and telephony at night you will lay a sound foundation which will enable you to look forward to the day when your photograph (specially taken) will appear as one of the "notables" in the TELEPHONE JOURNAL.

You may fail to see for the first few years what good this study is doing you, but as sure as fate the day will come when you will be asked to trot out the formula for compound interest or cube root, and if you can't do it then there's an opportunity gone. Don't let the idea that some chaps are lucky or have someone to push them on keep *you* from being *ready* to grasp every opportunity which comes your way, and if you thus show yourself to have ability, resource and grit you simply can't help "getting on."

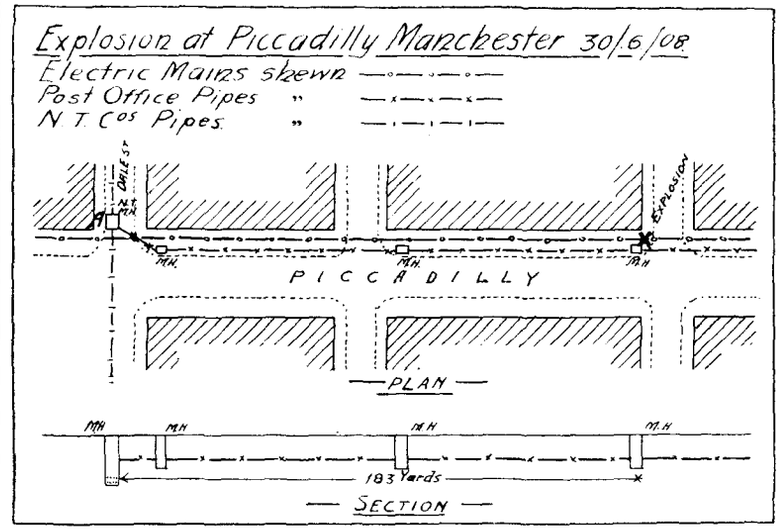
Now, boys, you've put your shoulder to the wheel—keep shoving!

A MANHOLE EXPLOSION AT MANCHESTER.

BY A. MAGNALL, *District Engineer, Manchester.*

MANHOLE explosions do, unfortunately, sometimes occur, but the effect of one recently in Manchester was so much out of the common that perhaps a note on it might be of interest to readers of the JOURNAL.

On referring to the sketch, the position of the Company's pipes and manhole, the Post Office pipes and boxes and the electric light mains will be seen.



In manhole marked "A," two of the Company's men were engaged jointing cables.

At point marked "X," 183 yards from this manhole, the electric light cables fused, an explosion occurred, and the gases generated were conveyed by the Post Office pipes into the manhole "A," almost suffocating the men, so much so that one man became unconscious and had to be pulled out by ropes, which was a difficult and dangerous process.

FIRE ALARM WORK.

ANOTHER case has come to our notice where the telephone was the means of giving a prompt fire alarm and averting what might have been (but for the immediate attention at the exchange) a very serious fire.

A subscriber at Emsworth, a Mr. Reeves, of Northlands, Emsworth, Telephone No. 30Y, rang up the exchange manager at Portsmouth and thanked him for the quick response that was given to his call at 12·30 on the previous evening, and added that, but for the immediate attention of the fire brigade, the house would have been burned down instead of some trifling damage being done to the upper storey.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

THE following grants were made during July:—

Traffic Department	£12	0 0
Engineers' „ (*a*)	2	7 6
(*b*)	3	0 0
Maintenance „ (*a*)	5	0 0
(*b*)	3	0 0
Total number of grants to July 31, 95.		
Total amount paid in grants	£266	12 3
Number of members 2,852.		
Donations received during July:—		
Entertainments Committee (on account) ..	£50	0 0
National Telephone Company	9	13 0

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(*Continued from page* 88.)

It was obviously unnecessary that boats going on such short voyages should carry a chaplain, but the Rev. Hippolito Luzany, minister at Harwich, had a stipend for attending to the sailors when on shore and for "doing their offices of birth, marriage, and burial." To encourage them to greater exertions in the combats which they had with the enemy, they were allowed to take prizes if they fell in their way, and they received pensions for wounds according to a code drawn up with a nice discrimination of the relative value of different parts of the body, and with a most amusing profusion of the technical terms of anatomy. Thus, after a fierce engagement which took place in February, 1705, we find that Edward James had a donation of £5 because a "musket shot had grazed on the tibia of his left leg"; that Gabriel Treludra had £12 because a shot had "divided his frontal muscles, and fractured his skull"; that Thomas Williams had the same sum because "a Granada shell had stuck fast in his left foot"; that John Cook, who "received a shot in the hinder part of his head, whereby a large division of the scalp was made," had a donation of £6 13s. 4*d.* for present relief and a yearly pension of the same amount; and that Benjamin Lillycrop, who "lost the forefinger of his left hand," had £2 for present relief and a yearly pension of the same amount.

The Postmasters-General, in a letter to their agent at Falmouth on the subject of pensions for wounds, inform him thus: "Each arm or leg amputated above the elbow or knee is £8 per annum; below the knee is 20 nobles. Loss of the sight of one eye is £4; of the pupil of the eye, £5; of the sight of both eyes, £12; of the pupils of both eyes, £14; and according to these rules we consider also how much also the hurts affect the body, and make the allowances accordingly."

The Postmasters-General were evidently continually troubled during the war by special consignments to them of goods and parcels, and even human beings, for whose safe transportation to their destination they were to be held responsible.

So various were the articles entrusted to them, that I will jot down a list culled from a very few pages of the agents' letter-book:—

"*Imprimis.*—Fifteen couple of hounds going to the King of the Romans with a free pass.

"*Item.*—Some parcels of cloth for the Clothing Colonels [*sic*] in my Lord North's and my Lord Grey's regiments.

"*Item.*—Two servant maids going as laundresses to my Lord Ambassador Methuen.

"*Item.*—Doctor Crichton, carrying with him a cow and divers other necessaries."*

The Act of 1 George III, c. 25, provided for additions to the American Packets and cheaper rates to New York and America, and the rate for a single letter not exceeding fifteen miles was reduced to 1*d.*, etc., but these rates were raised in the twenty-fourth year of George III by 1*d.* to every existing charge.

In 1708 Povey started a ½*d.* Post for delivery in London City, and I fancy used a hand-stamp. Some correspondence regarding this may be found in a newspaper called *The General Remarks*, 1709.

In 1768 Peter Williamson, the keeper of a coffee-house in the hall of the Parliament House, inaugurated a 1*d.* Post in Edinburgh. (I should be very glad if anyone could give any additional information regarding any of these old Penny Posts.)

In 1770 an Act was passed establishing Post Offices in all His Britannic Majesty's domains.

At certain Government offices I believe letters might be handed in for delivery, and a fee paid, the cover being stamped "Post Office Government Fee." The Post Office, also, I believe, issued franked covers on which were printed "Post Office printed matter under 1 oz. price 1*d.*," and "Post Office written matter under one drachm price 2*d.*," but I have never heard of any specimens.

In 1710 the Acts relating to the Post Office were completely remodelled by the statute 9 of Anne, c. 10, which remained in force till 1837. This Act, I may state, again excepted the Universities. It also established the first surveyors of the Post Office, an office which still exists but with varied duties. Franking was curtailed in 1705, and I find a Committee sat in 1735, but cannot trace when franking first came into use.

The abuses of franking were carried to an enormous extent. It is on record that a pack of hounds were sent free by this means. Members of Parliament even paid their servants by giving them franked envelopes for sale. They deputed others to sign for them. I illustrate an executed form as used, which in this case was legitimate (Fig. 1).

I have a letter Franked by Lord Brownlow, but used and signed Arnold.

In 1771 Dr. Dodd was hanged at Tyburn for forging franks. I have an original broadside, 12 Nov. 1802, offering a reward of £50 for the apprehension of John Hatfield for counterfeiting the Handwriting of a member of Parliament.

The trouble not having abated in 1764, 1784, and 1795, they were again further restricted, but the privilege was not withdrawn until the issue of the temporary envelopes to the members of Parliament in 1840.

Even at this comparatively late date there was not a sufficiency of small copper coins, and thinking it might be interesting, I show a ½*d.* token issued by Holloway, dated 1794, having the elevation of the Post Office on the obverse, in red mint state.

Of the earlier tokens issued by Postmasters I know of the following issued between 1647 and 1672 by:—

1. Robert Warner, Ballinasloe, Ireland.
2. Richard Harrison, Belturbet, Ireland.
3. Thomas Moore, Carlow, Ireland.
4. Thomas Baker, Chester.
5. Will Fleory, Dublin.
6. William Place, Grays Inn Gate, London.
7. Will Tiler, Guildhall, London.
8. Thomas Wilmot, Guildford.
9. Henry Cleaver, Hounslow, Ireland.
10. W. L. King's Head Post House, Love Lane, London.
11. Ralph Bullock, Maynooth, Ireland.
12. Ann Leverington, Norwich.
13. Samuel Northcott, Plymouth.
14. Thomas Kingsford, Sandwich.
15. Edward Roberts, The Strand, London.
16. Abraham Vaughan, Youghall, Ireland.
17. Thomas Butler.
18. Post Master, Bury St. Edmunds.
19. Post Master, London.
20. Mr. John Palmer.

I should be glad to purchase any of them.

The General Post Office in these early days of its organisation did not convey beyond the principal towns, and local Penny Posts were established or guaranteed to the small places. There is an interesting article on these by

* The above is abstracted, as are a great portion of these notes.

To His Majesty's Postmaster-General.

I Archibald Lord Douglas of Douglas

do hereby give Notice, pursuant to the Act of the 42d Geo. III. Cap. 63, that being disabled by bodily Infirmity from writing the whole Superscription of my Letters, I have appointed George Wentworth my Steward

to write my Name upon and superscribe them for me, so that they may pass free of the Duty of Postage.

Dated the 5th day of March 1827

Signed and sealed by me

Douglas

FIG. 1.

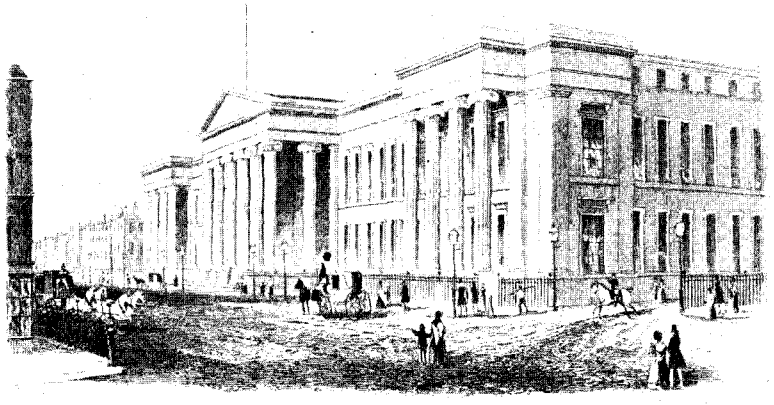
Printed by J. Hartnell, Wine-office-court, Fleet-street, for His Majesty's Stationery Office.

C. F. Dendy Marshall, B.A. These posts were first established in 1793, and until 1838 the postmarks were usually the name of the head office of the district and a number denoting the place from which it came.

Fifth Clause Posts—so called from the number of the clause of the 1801 Act, 41 George III, c. 7, under which they were authorised, were established to bring correspondence of villages under the control of Postmaster-General. They only differed from the Penny Posts inasmuch as franks and newspapers were charged 2*d.* on delivery, but as after 1807 this was annulled, and they were delivered free, the growth was shifted, and in 1839 there were only 52 in existence. For instance, Bristol had 63 Penny Posts and only one Fifth Clause Post.

According to Stow the Post Office was first located in Cloak Lane; early in the seventeenth century it was removed to the *Black Swan, Bishopsgate Street*, where it remained until the great fire of 1666, when a temporary office was opened near Covent Gardens, and afterwards removed to Lombard Street about 1678 to the house of Sir Robert Viner (or Vyner), who when Lord Mayor of London had built it in 1675, and it was here that he entertained King Charles I with a freedom which now seems remarkable, for when the King was about to retire the Knight laid hold of his Royal guest and swore, "Sire, you shall take t'other bottle," to which the not wholly reluctant Monarch rejoined appropriately, "He that's drunk is as great as a king." And turning back he did as he was bidden.

The General Post Office was transferred on Sept. 29, 1829, to St. Martin's-le-Grand. I show an old engraving of remains which were discovered during excavations, and were found to be of the crypt of the College of St. Martin's, and I show also a print of the General Post Office in original elevation before the storeys and other additions were made.



In the old days the postmen were allowed to collect letters from houses and to keep the penny which was paid for the service. They carried a bell to notify their approach. I have abstracted the following:—

"THE LETTER-CARRIER'S LAST KNELL.

"We have just lost another of what poor Thomas Hood called 'those evening bells.' The Postmaster-General having issued his fiat for the abolition of 'ringing bells' by the Letter-Carriers, the last knell was rung in the City on Wednesday last. The 'ringing' will be entirely discontinued after the 5th of next month; and, as a memorial of the departure from what appeared to most persons a very useful practice, our artist has sketched a letter-carrier, on his last evening call at our office: and another hand has appended the following lament:—

"THE WAR AGAINST THE BELLS.

Bell-ah! horrida Bell-ah!

The Postman's Bell.

"Don't talk of the Punjaub—of Hardinge and Gough;
Don't talk of Bugeaud and his feats in Algiers;
Don't 'fling me the picture' of old Kutersoff,
Of Wellington, Bony, and all their compeers.
A war still more horrid than ever that florid
Old minstrel, hight Homer, could tune to his shell,
Rests for my poor singing—the war against ringing
The Dustman's, or Postman's, or Muffin-boy's Bell.

"The Dustman was first to forego his brass clapper;
The Muffin-boy speedily followed his shade:
And now 'tis the Postman—that double-tongued rapper—
Must give up his Bell for the eve's promenade.
'*Tantæ Animis?*' sage Legislators!
Why rage against trifles like these? Prithee tell,
Why leave the solution to rude commentators,
Who say that at home you've enough in one Belle.

"What! *there* you get tongue enough! Out on the libel:
You feel more respect for the 'public of letters;
Were I in the House, I would introduce my bill
To free every Bell from dull silence's fetters.
Next stop the dumb-waiter's Bell—muzzle St. Paul's—
No more let 'Old Tom' on the atmosphere swell.
But there's one exception when Cupid enthralls,
Obey the old maxim, and pray *Ring the Belle.*"

THE LAST POST OFFICE BELLMAN, OR ONE OF THE MEANS OF COMMUNICATION.

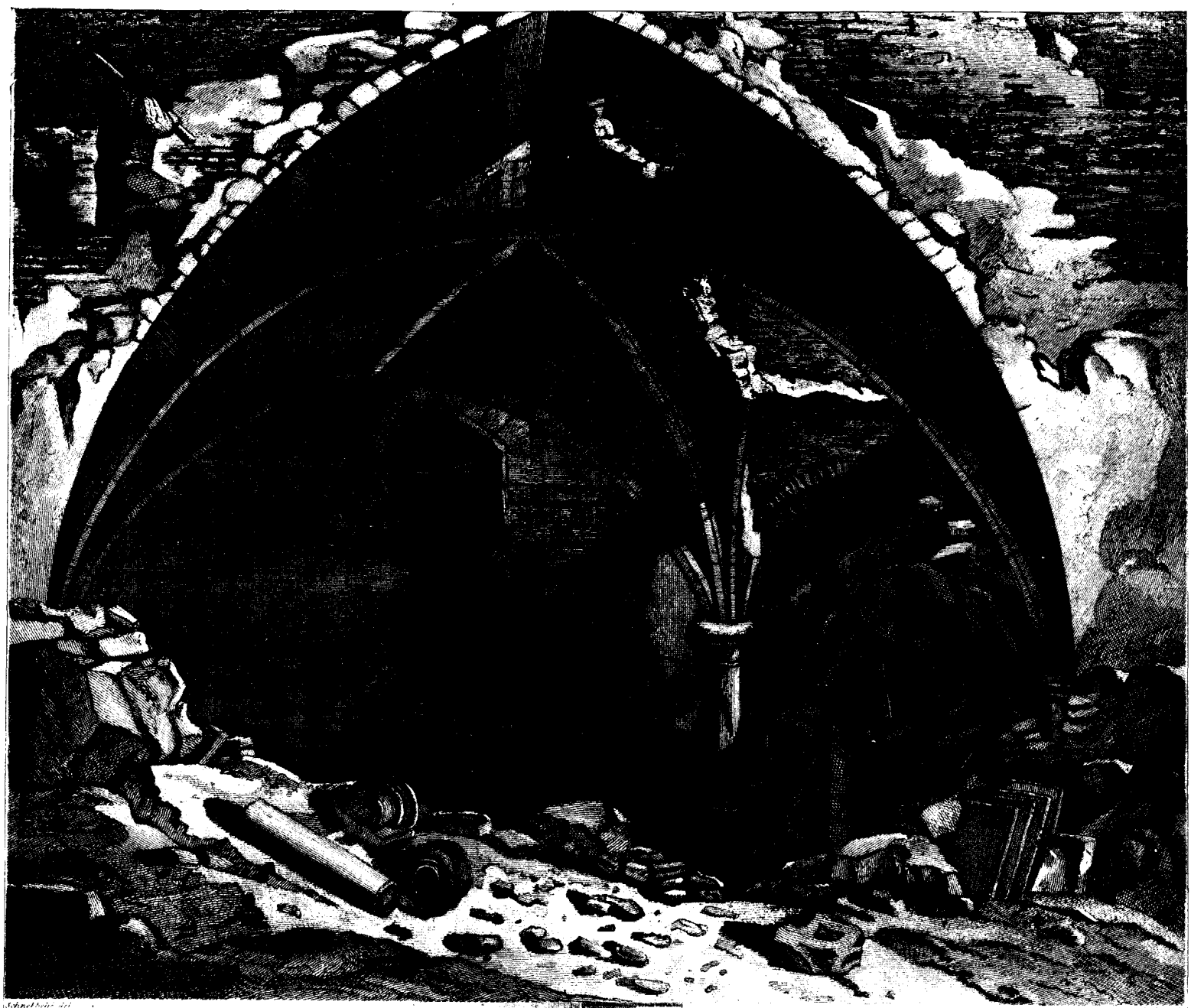
Pillar Boxes were first suggested in a letter to *The Times*, Nov. 9, 1840. I illustrate the first erected in March, 1855.

THE NEW POST OFFICE LETTER BOX AT THE CORNER OF FLEET STREET AND FARRINGDON STREET.

On Nov. 11, 1830, the first mails were sent by railway from Liverpool to Manchester, which, in the words of one of the old mail coach guards, "began to make a gridiron of old England."

It will be remembered that Boswell stated that Dr. Johnson did not believe the rate of travel could ever equal twenty miles per hour.

The distance from Liverpool to Manchester is about 50 miles, and, as illustrating the contrast between present-day travelling and that in the early days of railways, a document among the archives of the Liverpool & Manchester



Railway, one of the pioneer lines of England, exhibits a state of things which appears to us to-day simply ludicrous. The document bears the following regulations regarding travel:—

1. Any person desiring to travel from Liverpool to Manchester, or *vice versâ*, or any portion of the journey thereof, must, 24 hours beforehand, make application to the station agent at the place of departure, giving his name, address, place of birth, age, occupation, and reason for desiring to travel.

2. The station agent, upon assuring himself that the applicant desires to travel for a just and lawful cause, shall thereupon issue a ticket to the applicant, who shall travel by the train named thereon.

3. Trains will start at their point of departure as near schedule times as possible, but the company do not guarantee when they will reach their destination.

4. Trains not reaching their destination before dark will put up at one of the several stopping places along the route for the night, and passengers must pay, and provide for, their own lodging during the night.

5. Luggage will be carried on the roof of the carriages. If such luggage gets wet, the company will not be responsible for any loss attaching thereto.

In 1839 the Duke of Wellington left Brighton sitting under the sheltering hood of his open carriage, which, with its back turned towards the locomotive, was mounted on an ordinary truck at the rear of the train.

In comparison the following illustration of old-day travel is amusing:—

"On a mail coach a lady passenger advised her fellow traveller to place his money, amounting to ten guineas, in his boot for safety. On Hounslow Heath the customary highwayman appeared presenting pistols, demanded of the lady her money or her life. She, protesting poverty, promptly advised inspection of the gentleman's boot; as a consequence the highwayman went off ten guineas the richer. Next day at the inn the lady explained her strategy: she had £1,000 in her pocket which she had saved by her ready wit, and for which she handsomely presented the gentleman with £100."

(To be continued.)

HIC ET UBIQUE.

THE *Zeitschrift für Schwachstromtechnik*, the leading German technical paper which concerns itself with telephone matters, has published a lengthy series of articles on telephone tariffs to which we shall at present only refer briefly. The writer says "that the single telephone call varies so much according to time, place and duration, both as a fragment of the service rendered and in respect of its value to the subscriber, that a *pure* measured rate tariff is an impossibility." He argues that as all measured service subscribers pay equally a given annual sum, whether they make few or many calls, in addition to the charge per call, the actual price per call varies to each; he also contends that a pure measured rate should not levy the same charges to subscribers whose installations necessitate the running of a mile or a few yards of wire respectively.

Beyond certain distances from the exchange the rates *are* usually graded according to distance, and the objection to some extent falls to the ground. It is obviously impracticable—however consistent with "purely" measured tariffs it might be—to have vexatious grades of rate for every few yards from the exchange. The fact remains unaltered that the volume of traffic passing over the wires is the most important factor in the cost of the service and hence in the framing of the rates; and beside the enormous variations between the traffic of the large and small user all other discrepancies are as nothing. The levying of an annual charge in addition to the charge per message may detract from the purely measured basis of the rates, but obviously some minimum must be fixed to cover the fixed charges on original outlay.

ACCORDING to a paragraph in the daily papers, Mr. Cosmo Bonsor, the chairman of the South-Eastern Railway, has found other causes besides the wicked trams for a decrease in the passenger receipts. Amongst these is the telephone, and the habit acquired by ladies of ringing up the shops in London and thus saving their railway fares to town. It is a result which was certainly to be looked for and its significance will, no doubt, not be lost on contract officers. Shopping by telephone is an institution which has come to stay.

THE JOURNAL evidently finds its way to Fort Worth in Texas, for the general manager of the telephone company in that town kindly sends a form of postcard which he says is very effective in advertising—

Mr. ——.

No. — called you to-day and we were obliged to advise him that you did not have a telephone.

Do you realise that you are losing many connections by not having a Fort Worth telephone?

FROM amongst the curiosities which come before enquiry operators our Portsmouth correspondent sends us the following:—

"What is the number of *Mr. King* of the *British Queen*?"

"I notice that *Mr. Shortt* spells his name with two t's to make it long."

"316, formerly *Gray*, is now *White*."

IT is rather amusing to read that the *salons* at the Paris exchanges which were lately held up by the *Sphere* for the admiration of British telephone administrations (who, however, obtusely failed to admire, having already well-equipped retiring rooms of their own) are the subject of bitter complaint in a French telephone journal. It seems that the operators spend all their time ascending and descending stairs to these *salons*, and have only five or ten minutes left to eat their luncheons. There are *inspectrices de l'hygiène* who fail to inspect, and other drawbacks. These things, we are told, must cease.

Extract from *London Opinion*:

"—— he spoke into the receiver."

Although he may have been excited at the time, we should have thought "The Master of Mysteries" would have remained rational enough to speak into the transmitter.

CORRESPONDENCE.

PRODIGALITY IN CORRESPONDENCE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. E. J. FRASER'S somewhat splenetic style of writing makes one almost chary of commenting on his statements in view of a possible reply, but I should like to refer to two of his points.

First, as to the alleged redundancy of Mr. Prentice's opening paragraph. An article scarcely belongs to the same category as a business communication, and I think a little reflection will show Mr. Fraser that the brevity desirable in an official letter would be out of place in an essay. I am afraid that if Mr. Fraser's reasoning were applied to literature in general, the works of George Meredith, for instance, would have to be consigned to the waste paper basket.

As regards Mr. Fraser's second point, he seems here to be merely quibbling with words. The letter returning the plan may not have, and obviously did not, originate the whole correspondence, but it certainly was the origin of the redundant reply from the district pilloried by Mr. Prentice. Mr. Fraser is here, if I may say so, indulging in the practice, common to controversialists, of setting up his own dummy to be knocked down again by himself.

His remarks as to amending plans are somewhat obscure to those unaware of what is apparently rankling in Mr. Fraser's breast and they are certainly irrelevant; I might almost say redundant.

In conclusion, one cannot help regretting that, apart from an obscurity of style which makes Mr. Fraser somewhat difficult to follow, his letter should be couched in a tone which he alone among your contributors seems to find necessary for the expression of his views.

Aug. 19. L. J. FARRIES.

TERMINATING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

To engineers and to those whom it may interest, may I be allowed to ask a question on the above subject of terminating. According to technical instructions issued, we have two classes of terminating, viz.—

(1) Single terminating on S.A. cups from which lines are led away by covered wires.

(2) Double terminating on S.I. cups, in which case there are two wires on the insulator, one in each groove. There are two classes of arms, coded as an O.A. 81 inches and O.A. 82 inches, the O.A. 82 inches being the terminating arm.

Does this class of arm technically employed cover both classes of terminating?

Southport, July 17. —— T. DAY.

"PRACTICAL ECONOMY."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE article on the above subject by Mr. F. W. Roberts, Local Manager, Brighton, is worthy of study, but I cannot altogether agree with the process he suggests in the last paragraph of his article under "Clerical," with regard to booking out certain stores, such as cups, bolts, etc., for N. or any other works orders until they are actually required for immediate use; my objection is that ultimately confusion would result, and careless handling of stores would be encouraged.

A certain system adopted in one district, whether storekeeping or otherwise, may prove successful, and in another not so.

Briefly, I state a few points that present themselves to my mind. You book out 200 S.I. cups, S.A. cups, insulator and arming bolts, brackets, etc., of their respective sizes or description to N. works orders. Bins are required for each of these articles, which would not only take up more room in the stores, but lessen accommodation for getting about, and also give the storekeeper more work in general supervision of these bins.

Further, what reliance would there be that the stores taken out of these N. bins would be used for such works orders and none other? The gangs are at the stores in the morning to start out on their particular jobs, some on N. and others on O. C., etc. The foreman of each gang is hurrying up the storekeeper and his assistants for their requirements, an O. C. gang may require a large quantity of S.I. cups, and owing to the general or ordinary stock having run low the required quantity is taken from the N. bin, which is not credited, and thus trouble commences. Even if N. is credited, time would be involved.

Again, it does not require much of these stores to run up to £20 or £30, and when the expenditure is made up at the end of the month, N. is found to be overspent. This is traced to materials issued out as used but not used. The district manager objects, consequently to adjust the matter N. must be credited, and to arrive at the correct figure of the stores actually spent on N. would be a puzzle involving much time and trouble. On the other hand, presume N. is underspent, to cut it short, the district manager or engineer has only to fill up the N. bins.

With regard to the stores clerk, I fear if the system were adopted, although he might find it very nice and comfortable month by month, when stocktaking came round, such magnificent and unaccountable differences would present themselves that he would regret the system. It is far better for a stores clerk to enter individual entries than to suffer for it after.

I further suggest that if a district manager requires to know the particulars of quantity of the stores used on a certain N. works order it could not definitely be given, but only verbally, which is not satisfactory. I maintain that stores should be handled and dealt with on the same principle as cash and with as much care. Personally, I think if paragraph 26, section B1, p. 3, is adhered to, correct storekeeping will be maintained with more satisfactory results in the long run to those concerned.

I fully appreciate Mr. Roberts' object in trying to lighten clerical work, and should my views on stores work be wrong I shall be much gratified if he would enlighten me on that also.

Gloucester, July. —— STERIKER HARE.

SOME OBSERVATIONS ON STORES AND STOREKEEPING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

No doubt your subscribers have read with appreciation the very interesting observations made by "A Stores Clerk" on that important branch of the Company's work, viz., "Storekeeping and Stores Bookkeeping," and his advice to stores clerks to educate themselves so that they may take an intelligent interest in their work is of the best. Whilst not wishing to be critical, I feel reluctantly compelled on behalf of the department at Head Office responsible for dealing with the results of the annual stocktaking to refer to the second reason which "A Stores Clerk" assigns to the importance of correct storekeeping *not* being realised, viz., "the practice carried out in the adjustment of stock." The very nature of the detailed instructions drawn up with regard to the annual stocktaking in the Service Instruction Book proves the importance attached by Head Office to the annual survey, and it is in no perfunctory manner, as is evident from the fact that so many of the stock sheets are going backwards and forwards from Head Office to the districts between July and December, that the differences are scrutinised when the returns are received from the districts, notwithstanding that local investigation should have already been made according to the instructions and the differences traced where possible and adjusted to the particular accounts and works orders concerned. No amounts are authorised to be written off to "stock difference" account until Head Office is satisfied that further investigations would only be fruitless.

"A Stores Clerk" is somewhat unfortunate in the example he has selected to illustrate his point in paragraph 2, as the instruction with regard to all deficiencies in the "instrument" stock is "THESE MUST BE FOUND."

At the risk of being redundant I will repeat one does not wish to criticise, but at the same time I think "A Stores Clerk" rather discounts the value of his remarks when he makes the sweeping assertion without adequate grounds, that "Amounts are written off year after year with little or no comment."

Telephone House, Aug. 17. —— W. E. WESTON.

COMMERCIAL CORRESPONDENCE CLASS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MEMBERS of the staff who desire to learn the electrical or engineering branches of the Company's business can do so by joining the Correspondence Classes and studying the valuable papers issued in connection with these classes, but at present there do not seem to be the same facilities for acquiring knowledge of the commercial side. I would therefore suggest that a Commercial Correspondence Class be formed. Such a class would, I think, be a great advantage to a considerable number of the staff, especially to junior clerks, giving as it would an opportunity of studying the Company's system of accountancy, bookkeeping, etc., as practised in every department of the district and local office.

—— GEO. ARCHIBALD.

CO-OPERATIVE HOLIDAYS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

DOUBTLESS a large number of the Company's staff spend their annual holidays in touring the Continent, etc., under the auspices of the various travelling agencies, and a still larger number would do so if they could be sure of meeting with congenial companions, which they are not in the average "Cook's" party.

Would it not therefore be possible to run our own co-operative holiday tours for the staff and their friends only? Or, failing this, we could surely get sufficient members to form a telephone party to accompany one of the existing touring parties.

Arrangements might almost be made for our party to visit telephone exchanges and other places of special interest to the staff.

Perhaps others who are interested will communicate their views on the matter.

Maidstone. S. C. SMITH, District Manager.

THE CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. STANLEY BYNG'S proposal is a drastic one and would have one of two effects—either the courses would have to be made compulsory or few would take them. If we all had backbone enough to continue in our courses and did not take out classes in which we know beforehand we should excel, Mr. Byng's proposal would be a good one. In the meantime the committee could make use of "the evidence presented," for they have not done so fully.

Without upsetting the existing arrangements, at the beginning of the session a very simple task might be taken in hand by the committee. They might ask those who propose to take, say, "M" course and "N" course what benefit is going to be gained from the former. Looking over the list of awards for the past session's work I have picked out eight who have taken both of these courses. It would be interesting to know what good their average of 91·35 per cent. in "M" course has done students who have contrived to get an average of 88·46 per cent. in "N" course. The height of absurdity in this connection is reached when we find one student gaining more in "N" than in "M."

Edinburgh, Aug. 13. —— EDGAR J. FRASER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

Now that the Correspondence Classes are about to commence it may be of interest to other districts to know of the method adopted here of assisting those members who have difficulty in understanding certain portions of the text books or in following the framing of certain questions.

Every member of the staff is invited to place written queries into a locked box placed in an easily accessible position. He is not required to append his signature. Then at a fixed date previous to the sending in of the answers to each paper the members meet and together discuss and tackle the questions found in the box. It must be understood that no questions from the paper are worked out. Should any member have asked how to work a certain question it is explained to him, but different values are inserted.

I think the above practice, or anything similar, of inestimable value to certain members, who must at times be floundered by formulæ, diagrams, etc. It so often happens that a few moments' explanation transforms a poser into a very simple question.

Leicester, Aug. 13. —— M. MARSDEN.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to Mr. Byng's letter in the August JOURNAL, the committee of the classes considered some time ago the desirability of holding some sort of examination, but the result of the enquiry made did not justify the idea being proceeded with. Information of this fact was given to districts by circular as far back as January, 1906.

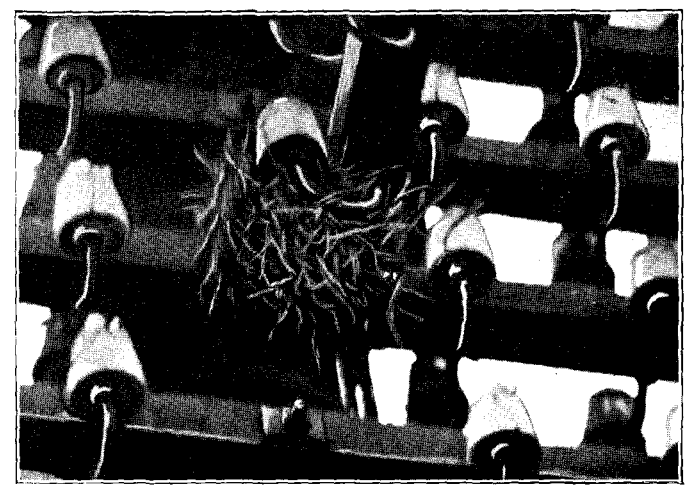
Aug. 5. P. H. C. PRENTICE (for the Committee).

BIRDS' NESTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

YOUR Cairo correspondent, who last month published an account of a bird's nest among his wires, will probably be interested in the accompanying photograph—taken, by the way, at some risk to the artist's neck.

On June 6 I found a sparrow's nest built between an arm and pole of a heavy route at Sunningdale. The nest contained five lusty fledglings. Ascending the pole again a few days ago, I found another family of five just hatched.



I found a courageous photographer, whom I lashed to the nearest tree, and so obtained the picture.

Your correspondent will observe that my nest differs from his with regard to the scraps of wire and vulcanised rubber, and I would point out that it is not only because the sparrow uses other materials for nest building, but because our Company's regulations require that no "scrap" shall be left lying about for prowling-birds!

Ascot, July 22. J. MAGGS, Inspector-in-Charge.

DESICCATION OF DRY-CORE CABLE.

THE heading of the table in the second column of Mr. Street's article (p. 94) *should read*: lbs. per square inch "absolute," *instead of* "absorbed."

NEWS OF THE STAFF.

On Aug. 1 a sub-committee acting on behalf of the eight districts in the Midland province presented Mr. ARTHUR E. COTTERELL, late Assistant Superintendent, with a Chesterfield settee on the occasion of his being transferred from the province to his new position in the south. The Midland staff expressed their sincere hope for his happiness, health and prosperity in his new position, and that the gift would long bring back pleasant memories of his association with the province. Mr. Cotterell expressed his best thanks, and mentioned that he much appreciated the goodwill of the staff throughout the Midland province and their kindness in making so handsome a present, and the thoughtful action of the presentation committee. From first to last he mentioned that he had had evidence of great kindness and goodwill which would hold an abiding place in his memories of the Midlands, already crowded with so many pleasant associations. Mr. Cotterell was also the recipient of a silver travelling clock from Mr. Coleman, the Provincial Superintendent, and of a silver card-case from the clerical and other staff of the provincial office.

Mr. A. WATTS, of the Engineer-in-Chief's staff, who has been located at Manchester since 1897, has been appointed Chief of the new Lines Department which has been established at Head Office, and will take charge of the whole of

lines staff attached to the Engineer-in-Chief's Department. This arrangement also involves the transfer of Messrs. J. M. SHACKLETON, W. J. GRAY and W. CROMPTON from Manchester to Head Office.

Mr. F. W. TAYLOR, the late District Manager at Brighton, on his promotion to the management of the Manchester district, was presented by the Brighton staff with a handsome tea and coffee service and a spirit kettle suitably inscribed. The presentation was made at the annual outing of the Sussex staff at Beeding by Mr. Roberts, the Local Manager, who, in a short speech, expressed the regret of the staff at parting with Mr. Taylor, whose feeling response was received with great enthusiasm.

Mr. JAMES KERR has been promoted to the position of Chief Inspector, Aberdeen, in consequence of the resignation of Mr. J. W WHITE, and Mr. JAMES SHEARER has been promoted to the position of Assistant Chief Inspector.

Miss J. M. MCMILLAN, of the Correspondence Department, Salisbury House, has passed the recent London Chamber of Commerce examination in typewriting, with distinction.

Miss A. B. CUNNINGHAM, Supervisor, Royal Exchange, Glasgow, has been promoted to be Senior Supervisor, Argyle Exchange.

Miss JOANNA ROBERTSON, Supervisor, Argyle Exchange, Glasgow, has been promoted to be Clerk-in-Charge, Tron Exchange. She was presented with a pearl spray brooch by the Argyle Exchange staff.

Miss MARGARET KAY, Clerk-in-Charge, Tron Exchange, has been transferred to be Clerk-in-Charge, Charing Cross Exchange, Glasgow.

The following contract officers have been transferred from Glasgow:—JOHN CHRISTIE, to Plymouth; SAMUEL BRAHAMSON, to Dundee; L. W. MCCALLUM, to Ayrshire; J. SOUTHWELL, to Edinburgh; H. F. GLEN, to Dublin.

Miss IDA ROGERSON, Senior Operator, Manchester Exchange, has been transferred to Blackpool. She was presented with a case of silver afternoon teaspoons by her Manchester colleagues.

Messrs. G. F. AKED, G. H. CARRIER, and D. CLAYSON, D.S. (all of Nottingham), have obtained second class certificates for telephony in the City and Guild examination recently held at Nottingham.

Mr. F. H. HAYDEN, Chief Inspector, Hop, was, on the occasion of his transfer to Gerrard, presented with a silver tea service by the staffs of the Southern district. The presentation was made by Mr. W. Blight, the Divisional Electrician, who requested Mr. Hayden to accept the best wishes of all concerned for his future success.

Mr. A. BOYLE, Junior Inspector, Belfast, was on the occasion of his transfer to Limerick as Instrument Inspector presented by the members of the Electrical staff with a silver cigarette case.

London and City Guilds Examination.—The following members of the Bradford staff, under the tuition of Mr. C. Wood, Exchange Inspector, Bradford, and Instructor at the Telephony Class, Bradford Technical College, Bradford, passed the ordinary grade, second class:—Messrs. C. JACKSON, J. H. JACKSON, J. FIRTH, H. BIRKBY.

Mr. A. SPEIGHT, Chief Fitter, Bradford, was successful as an external candidate in passing the above examination, first-class honours grade, and was also awarded a silver medal and a grant of £3.

The members of the engineering class, conducted by Mr. BALDWIN (Engineer, Birmingham), presented him with a silver cigar case as a token of their appreciation of the labour he had incurred in carrying through a course of engineering lessons during the past sessions, and hopes were expressed that he would be able to undertake a more advanced course during the ensuing year.

Mr. A. B. COUSINS, Local Office Clerk, Swansea, was the recipient of a case of pipes upon his resigning the Company's service.

Mr. T. R. HUGHES, Birmingham, has obtained a second class in honours for Telephony in the City and Guilds of London Institute examination.

Mr. E. Williamson, Birmingham, presented the certificates awarded for success in the National Telephone Company's telephony course on Friday, July 31. Mr. J. Scott, Assistant Provincial Superintendent, spoke a few words of encouragement to the members of the staff present, advising all who possibly could to take a course during the ensuing year.

Mr. C. MACDONALD has been transferred from the Inspectors' staff, Leicester, to Longton (Staffs).

Mr. A. NORTON, Inspector, Leicester, has been transferred to Dublin.

Leicester Correspondence Classes.—The Midland Superintendent awarded the certificates to those students in the Leicester district who were successful. Mr. Coleman encouraged all students to continue in this good work, and expressed his satisfaction at the interest taken in the classes by the heads of departments. Mr. E. L. Hague, Engineering Inspector, who was placed second, third and second in "B," "C" and "D" respectively, was specially commended.

London Traffic Department.—*Promotions and Transfers:*

Miss LILIAN BEVERLEY, Supervisor, Holborn, to be Supervisor, Operating School.

Miss ROSE TRY, Senior Operator, Gerrard, to be Supervisor at Holborn.

MARRIAGES.

Mr. A. WATTS, of the Engineer-in-Chief's staff, was married on Aug. 12, at Eastbourne, to Miss Constance Mansfield.

Mr. MELTON MARSDEN, Chief Inspector, Leicester, was the recipient of a handsome timepiece on the occasion of his marriage to Miss E. COX, of Sheffield. The District Manager made the presentation on behalf of the staff.

Mr. H. G. MCFARLANE, District Manager, Border district, was presented on the occasion of his marriage by the members of his staff with a handsome marble clock suitably inscribed. The presentation was made by Mr. T. Elliot, Chief Clerk.

Mr. A. WILSON, Chief Inspector, Greenock, was presented by the district staff with a marble timepiece on the occasion of his marriage.

Miss L. TOONE, Operator, Leicester, has left the Company's service to be married. A presentation was made to her on her retirement.

Miss AGNES MCWHIRTER, Senior Operator, Bridgeton Exchange, Glasgow, left the Company's service on July 30 to be married. She was presented with a silver cake basket by the staff in her exchange.

Miss ISABELLA JEFFREY, Senior Operator, Hillhead Exchange, Glasgow, left the Company's service on July 28 to go to Vancouver to be married. Before leaving she was presented with a dressing case by the staff in Hillhead Exchange.

Miss ISA MCALLISTER, Senior Operator, Argyle Exchange, left the Company's service on Aug. 6 to be married. She was presented with a dressing case by the staff in the Argyle Exchange.

Miss A. H. CAMPBELL, Senior Operator, Royal Exchange, Glasgow, left the Company's service on July 23 to be married. She was presented with a cake basket by the Royal Exchange staff.

Miss H. D. WILLIAMSON, Senior Operator, Royal Exchange, has resigned owing to her approaching marriage. She left the service on Aug. 15, and was presented by the Royal Exchange staff with a cake basket and butter dish.

Mr. A. WILSON, Chief Inspector, Greenock, was presented by the staff with a handsome marble timepiece on the occasion of his marriage.

On the occasion of her marriage to Mr. A. BARCLAY, Exchange Inspector, Aberdeen Central Exchange, Miss S. PATERSON, Senior Operator, Kittybrewster Exchange, was presented with a tea set by the operators, whilst Mr. Barclay was presented with a set of bronze figures, together with a silver cruet, by the members of the inspecting and other staffs.

Mr. WM. JEFFREY, Storekeeper, Galashiels, was presented with a handsome clock and jelly dish by the staff on the occasion of his marriage, which took place on June 19.

Miss EDITH WARD, Portsmouth, resigned after twelve years' service on July 24, 1908, to get married, and was presented by the Portsmouth and district staffs with a silver-plated tea and coffee service.

Mr. J. VAUGHAN, Contract Officer, Chester, was married on July 18 when the staff of the district presented him with a fumed oak bureau. The presentation was made by the district manager.

Mr. ERNEST WALKER, Wayleave Clerk, Keighley, was married on June 22. He was the recipient of a handsome case of cutlery from his colleagues, the presentation being made by Mr. E. E. Gregory, Local Manager.

Miss MARKLAND, Operator, Rawtenstall, resigned to be married on July 30 after twelve years' service with the Company.

Mr. H. W. CROWTHER, Chief Inspector, Dewsbury, was married to Miss M. A. RANDAL, late Chief Operator, Dewsbury, at Pickering on Aug. 4.

Mr. E. T. MANNING, Service Observation Clerk, Sheffield, was presented with a case of cutlery, suitably inscribed, as an expression of the good wishes of the staff on the occasion of his marriage on Aug. 3.

Mr. J. KEETON, Joiner, who was married on Aug. 19, was also presented with a similar case of cutlery. The presentations were made by the Local Manager, Mr. F. Barr.

Miss L. HARRIS, District Office, Birmingham, was on July 31 presented with a dinner service by the District Manager (Mr. E. Williamson) on behalf of the staff, on the occasion of her approaching marriage.

Mr. H. E. INMAN, Receiving Cashier, Metropolitan Office, was married on July 29. Mr. Stirling, the Chief Accountant, on behalf of the staff, handed to Mr. Inman on July 24 a clock in a very handsome Sheraton case, accompanying the presentation with a few words expressing the good wishes of Mr. Inman's colleagues.

Mr. A. E. WILD, Rentals Department, Metropolitan Office, was, in view of his wedding on Aug. 8, presented by the staff on the previous Thursday with a timepiece mounted in green onyx with a pair of bronze statuettes, and a case of silver napkin rings. Mr. Stirling, who conducts these little ceremonies in a very kindly way, again made the presentation before a large number of the staff.

London Traffic Department.—

Miss G. HUNT has left Kensington Exchange in view of her approaching marriage. She was presented by her colleagues with a china tea service and art pot.

Miss M. HAWKINS has resigned from the Kensington Exchange for the same reason. She was presented with a silver-plated teapot.

OBITUARY.

We regret to announce the death of Miss CHARLOTTE G. MCGILCHRIST, Clerk-in-Charge of the Charing Cross Exchange, Glasgow. Miss McGilchrist, who entered the service in March, 1889, had long been a sufferer from chronic asthma, but latterly complications set in and she died, as the result of heart failure, on Friday, July 24. She was on duty as usual up to the evening of Tuesday, July 21. Despite her ill-health, Miss McGilchrist was of an exceedingly cheerful disposition and took a lively interest in the many social functions organised by the staff. Wreaths were sent by the operators in the Charing Cross Exchange and by other members of the staff in token of the high esteem in which she was held.

MISS C. G. MCGILCHRIST.

We have also to record the death of Mr. F. MYALL, who for three years carried out the duties of Night Operator, at Aldershot, to the satisfaction of the subscribers and of the Company alike. A floral tribute was sent on behalf of the Guildford and Aldershot staffs.

After a long and trying illness, Mr. JAMES LITTLEJOHN, Night Operator at the Aberdeen Western Exchange, died on Aug. 14. As a token of the esteem in which he was held by the whole staff, two wreaths were placed on his grave in the name of the staff.

STAFF GATHERINGS AND SPORTS.

Edinburgh.—The Ampère Golf Club held their Bogey competition over Musselburgh course on July 25, when Messrs. J. H. Allan, P. Veitch, D. Pagan and A. Robson were the prize winners.

Norwich.—On Saturday, June 20. the Norwich Telephone Association held its third annual outing for male members. The company, which was joined by Mr. T. W. Capenhurst (Local Manager, Lowestoft) and Messrs. H. Barnes and S. Reeve, entrained at Norwich (Thorpe) for Wroxham, where the steam launch *Blanche* was waiting to convey them to Coltishall. At the Anchor Hotel, Coltishall, sports were indulged in and tea taken. After tea the party re-embarked for a trip down the Bure from Coltishall to Acle, whence train was taken to Norwich. The outing was an immense success. The following are the results of the sports:—440 yards' flat: 1, J. Allen; 2, A. G. Suggars; 3, B. B. Barcham, 120 yards' flat (Juniors): 1, G. J. Hardingham; 2, C. H. Thompson, Long Jump: 1, W. J. Pratt; 2, A. G. Suggars; 3, H. M. Cowles; 4, J. W. Fairhead; 5, G. J. Hardingham; 6, E. Betts. Tugs of war: Married beat Single. Inter-departmental (final), Electrical Department beat District Office. Prizes were given by Messrs. H. J. Allen, O. W. Stevens and E. J. Woods.

Manchester.—The Telephone Employees' Athletic Association held their annual general meeting on July 31, at which the balance sheet was adopted and officers and committee elected for the ensuing season. The secretary's report disclosed that the association is in a flourishing condition and now includes active sub-sections devoted to football, cycling, rambling, hockey, swimming and cricket. The cricket club is in the Manchester and District Works League and at the beginning of August only required to win one of three remaining matches to secure a shield for the club and gold medals for the players. The football club is again entered in the District Works League and is expected to achieve a satisfactory result. The president is Mr. F. W. Taylor and the principal secretary Mr. W. H. King (re-elected for the third successive season). The list of vice-presidents includes the names of Mr. George Hackenschmidt (of wrestling renown) and Mr. W. Meredith (Welsh international footballer and Manchester United).

Portsmouth.—On Wednesday, Aug. 12, on the occasion of the opening of the New South Parade Pier, a special steamboat was chartered and a cruise in the Solent was enjoyed by about 70 of the Company's employees and their friends. Embarking at the Point at eight o'clock a journey was made in the direction of Cowes, skirting the island to Ryde, and then across to see the illuminations at South Parade Pier. Refreshments were provided on board. Portsmouth was reached at eleven o'clock, and all were unanimous in declaring the trip a success.

On Saturday, July 25, the members of the staff at Portsmouth and friends, numbering 120, had a very enjoyable trip by steamboat to Beaulieu. A special steamboat was chartered, and on landing at Beaulieu games were indulged in until teatime, when tea was served by the river bank and a very enjoyable time was spent. Some of the party, which included the District Manager, Mr. S. J. Smith and Mrs. Smith, went for drives into the old village of Beaulieu and inspected the priory and other items of interest. The company re-embarked about 7.30, and, after landing the Isle of Wight contingent, proceeded to Portsmouth, which was reached about 10.30 after spending a very enjoyable day.

Nottingham Factory.—The second annual outing of the Table Sets and Cabinet Departments took place on July 25 at Hoveringham in splendid weather. A most enjoyable afternoon was spent by 110 members of the departments. Sports, including flat racing, egg and spoon races, three-legged races, fast and slow cycle races, cricket-ball throwing, etc., were indulged in. After a well-spread tea had been partaken of the prizes were distributed by Messrs. Fox and Wallace, the Foremen of the departments, and rambles, cricket and other amusements followed until return train time.

Cornwall.—On Aug. 8 30 members of the Cornwall staff, which included Truro centre and St. Austell and Penzance sub-centres, attended the first annual outing, which consisted of a drive from Truro to Newquay. On arrival at Newquay a cricket match was played between the outside and inside staff which resulted in a draw. The staff were afterwards photographed and then adjourned to the New Hotel for tea. Mr. J. Wilkinson (Local Manager) occupied the chair and expressed the appreciation of all present at the manner in which things had been arranged by the committee—namely, Messrs. Mansfield (secretary), Chapple, Harris, Griffiths and Sowerby. Mr. Walton, Chief Electrician, Plymouth, represented the District Manager who was unavoidably absent.

Leeds.—*Cricket (Chamber's Cup, Second Round)*.—The Leeds team journeyed to Bradley on July 18 to play the Huddersfield staff in connection with the above competition. Leeds batted first and scored 107, H. S. Casson being responsible for 36 (not out). Huddersfield made a good fight, but had to acknowledge defeat after scoring 49 all out. A. Grierson, for Leeds, had the following excellent analysis:—3 overs, 1 maiden, 5 wickets for 1 run.

The cup secretary has been fortunate in securing the splendid ground of the Western College Club at Harrogate for the final, to be played on Aug. 29. The competing clubs will be Leeds (holders) *v.* Middlesboro'.

Self-Help Society.—A society with the above object is in course of formation. The project has been taken up very favourably by the staff, 75 per cent. of whom have signified their intention of becoming members. The proposal being to pay 1*s.* per member per annum, the proceeds to be used for benevolent purposes amongst the members.

Dewsbury.—The first annual picnic of the Dewsbury staff took place on Aug. 8. The whole of the staff available, numbering 40, occupied two char-a-bancs, and thoroughly enjoyed a drive to Nostell Priory, a pretty little village, thirteen miles away in the midst of delightful country. A most excellent tea was provided, after which the party, with the kind permission of the park's owner, had access to the Priory grounds.

Belfast.—The staff held their annual picnic on Aug. 1 at Ballycarry, co. Antrim. The party, which numbered 70, departed by the Northern Counties Railway at 2.55, arriving at their destination at 3.30. The weather being all that could be desired a number took the opportunity of visiting the Gobbins which are in the neighbourhood, whilst others indulged in cricket and other outdoor amusements in the grounds attached to the Gobbins Hotel. After tea, games were resumed until nine o'clock, when the party, which included Mr. Gilmour, District Manager, and Mrs. Gilmour, left for home, having spent a most enjoyable day.

Swansea.—The district staff held their annual picnic at Park Mill on June 20, when 64 members, including Mr. W. E. Gauntlett (District Manager) and Mr. R. Williamson (Local Manager), who was accompanied by Mrs. Williamson, spent a most enjoyable day. The journey was made by brakes, Park Mill being reached at 4 p.m. The interval before tea was devoted to cricket, after which an adjournment was made to the Gower Inn, where tea was served. An excellent sports programme followed, the events being keenly contested, especially the tugs of war. The challenge shield was won by the electrical staff, who defeated the clerical staff, Miss Rowland's team were the proud winners of the silver plate, and the married men were victorious over the single men. The prizes for these and the other events were presented by Mrs. Williamson. The homeward journey was commenced at 8.45 p.m. and proved not the least enjoyable portion of the day's programme, the successful carrying out of which rewarded the efforts of the picnic committee, to whom a hearty vote of thanks was accorded. One incident only tended to mar the full enjoyment of the outing. Miss M. Sweeney, a Central operator, being knocked down by a cyclist and rather badly shaken. She was, however, able to look on, but not, unfortunately, to join in.

Exeter.—The staff and a few friends (in all about 40) had an outing on August Bank Holiday, the rendezvous being Bovey Tracey. Members of the Torquay staff joined the party at Chudleigh. A most enjoyable time was spent, particularly during the four miles' walk and climb to Hay Tor on Dartmoor and the pleasant run back to Bovey in brakes. The arrangements were made and successfully carried out by Messrs. H. Martin and F. V. Squire.

Brighton.—The Sussex staff held their annual outing on June 27. A big party journeyed to Bramber, their headquarters being established at the "King's Head," Beeding. A feature of the occasion was the fraternity subsisting between the staffs of the Company and the Post Office Telephone Department—quite a large number of the Department's staff of ladies, together with Mr. Cowie and Mr. Harkiss, taking part in the proceedings and assisting to dispose of the prizes offered in the sports competitions. The programme of sports was carried out in a field near by.

At five o'clock the party sat down to tea on the lawn, to the number of 127. Among those present were Mr. C. F. Moorhouse (the new District Manager, who presided), Mr. F. W. Taylor (his predecessor), Mr. F. W. Roberts (Brighton Manager), Mr. L. Parsons (Chief Clerk), Mr. F. J. Frost (Traffic Manager), the Local Managers of Eastbourne, Chichester, Worthing and Newhaven, Mr. H. Legge (Portsmouth) and Messrs. Cowie and Harkiss (General Post Office).

Immediately after tea the party were photographed, this being followed by the event of the day, a presentation to Mr. F. W. Taylor, who had been promoted to the management of the important Manchester district.

Aberdeen.—The annual picnic of the staff was held at Bieldside on Aug. 8, when a company numbering 150 enjoyed a very pleasant outing.

LOCAL TELEPHONE SOCIETIES.

Leicester.—The general meeting of this society was held on Aug. 13 before a good gathering of members. The hon. secretary's and treasurer's reports were read and duly passed. It was decided that no charge should be made for the programmes in future, and also that the annual subscription should be made 6*d.* instead of 1*s.* Some discussion was raised on this point, but eventually it was carried. A staff outing was suggested, and this was left in the hands of the committee to arrange.

The election of officers for the ensuing year was proceeded with as follows: Hon. president, Mr. Alfred Coleman; president, Mr. Leonard Price; vice-presidents, Mr. F. H. Tyas and Mr. M. Marsden; hon. treasurer, Mr. E. L. Hague; hon. secretary, Mr. P. V. Sansome; committee, Messrs. H. Marshall, F. Ellison, J. Bagley, A. W. Garrard, W. J. Bailey, H. Warren, H. Revitt, J. Harold, and Miss M. Barr, Miss C. Horner and Miss M. Law.

WIRELESS TELEPHONY.

ACCOUNTS have been circulated in the daily press of long-distance conversations by wireless telephony in France and Italy. In the former country the station on the Eiffel Tower (Paris) is said to have received "fairly clearly" a communication from Pointe du Raz (Finistere), and in Italy by Professor Majorana's system the voices of the operators at Monte Mario and Porto Danzio, 60 kilometres apart, were clearly heard. Communication was effected recently between Copenhagen and Weissensee (Berlin). In the absence of more detailed information, however, we suspend judgment.

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TELEPHONE MEN.

XXIX.—ARTHUR WATTS.

ARTHUR WATTS was born in Sheffield in 1865. After attending a preparatory school he received the main part of his education at the Sheffield Royal Grammar School. This was followed by a two years' course under the late Rev. Wm. Anderson, M.A., at Epworth. The all-round ability which his friends know in the man, was evidenced in the school career of the boy, as he showed himself an apt pupil, and while his name usually occurred on the prize lists in specific subjects, it was generally near the top of the aggregate lists, at least two first aggregate prizes falling to his share.

With a view to entering the business carried on by his people, after leaving Mr. Anderson he spent a year in the offices of Messrs. Jas. Andrew & Sons, chartered accountants, of Sheffield. The bent of his mind, however, was towards engineering, and so, in October, 1883, he applied for and obtained an appointment with the United Telephone Company in London.

The early days of telephony in this country are to the majority of the present staff somewhat nebulous, and the course of events ill-defined, and most of us do not assign to our colleagues their places in the organisation to a period prior to the time when the late General Manager was appointed. It will probably surprise many of Mr. Watts' colleagues, who have always associated him with the provinces (and especially with the north) and with outside work there, to learn or have recalled to them the fact that his first experience was gained in London and entirely on inside work.

He commenced as an operator at one of the Bell Exchanges in London. After some weeks' operating at Leadenhall he was sent to Eastcheap Exchange to learn the working of the "Edison" board, and when proficient he took the position of second in charge under Mr. Sandy at a new Edison board exchange just opened at Mincing Lane. During the erection of this exchange Mr. Watts gained practical experience by working during the evenings on the construction staff. A month or two later the operators at Leadenhall Exchange had got a little out of hand, and he was chosen as a suitable Clerk-in-Charge to pull things round. He was transferred to the fault staff in June, 1884, and with the change to rather more congenial work Mr. Watts increased his exertions to learn all he could about telephones.

In March, 1885, he was sent on loan to the Northern District Telephone Company at Sunderland, and for six months assisted in reconstructing the switchboard and subscribers' apparatus. During this visit a serious colliery accident occurred at Penshaw, a mining village near Sunderland, and it was largely due to the energy of Mr. Watts that telephone communication was established between the rescue party and the colliery offices at the surface. He was actually with the rescue party when the victims were found (twelve men and one boy), and telephoned the sad news to the office at "bank." The line consisted of about half a mile at the surface, a quarter of a mile down the shaft, and three-quarters of a mile "in bye."

In September, 1885, the offer was made to him of a permanent transfer to the Northern District, and Mr. Watts settled down on Tyneside as Local Manager at Shields. Four years later he was promoted to Newcastle as Engineer, and in 1891 added the duties of Local Manager to those of Engineer. The Northern District proved to be one of the best schools for the training of telephone men in the country. This was very largely due to the stimulating effect of opposition, the Post Office being in possession of the field with a metallic circuit system, fitted with instruments of the Gower Bell type. It is a matter of history that the success of the Company was due to superior service, backed up by better commercial methods of conducting business.

Shortly after the reorganisation of the National Company in 1893 the necessity of using metallic circuits throughout became fully realised, and early in 1895 a commencement was made in Manchester with the first of the underground schemes, Mr. Watts

being appointed Resident Engineer. Subsequently, Mr. Watts was appointed to the Engineer-in-Chief's staff as Technical Officer for Underground Works, with headquarters at Manchester. Since that time he has been associated with practically all the underground schemes that have been carried out by the Company. He has also taken an active part in several emergency jobs, such as the South Side and Royal Exchange fires, Glasgow, and the breakdown of the overhead plant at Hull by blizzard in 1898.

As will have been noticed, Mr. Watts this month completes 25 years' service with the Company, and, as if in commemoration of the occasion, he again returns to London in charge of the new "Lines Department" in the Engineer-in-Chief's office.

Mr. Watts was for many years an enthusiastic volunteer—in London in the Rifle Brigade, and on Tyneside in the Tyne Division Submarine Miners. He has always been fond of outdoor exercise, and at present he shows rather marked symptoms of golf.

Mr. Watts has taken part in the discussions at the Annual Meeting of Officers in London ever since their institution, and the facts and opinions he has adduced have always carried great weight. Among the local telephone societies he has done much good work by reading numerous papers on many subjects. In the provinces, especially, he is regarded as the exponent of the modern telephone problems of development studies, standards for construction of plant, and transmission. As an Associate Member of the Institution of Electrical Engineers he has made several useful contributions to their discussions. He serves the staff well as a member of the Central Committee of the Staff Transfer Association.

THE FIRE AT THE GUTENBERG TELEPHONE EXCHANGE, PARIS.

WE regret to learn that at 7 p.m. on Sunday, Sept. 20, a fire broke out at the Gutenberg Exchange, Paris, which completely interrupted the telephone service at this exchange and damaged many telegraph lines passing through it; 19,000 lines are down, and from the central position of this exchange the junction wire service to all parts of the city is affected. The fire also interfered with the work of the letter sorters at the adjacent Post Office, delaying the early morning delivery. There were 200 operators in the building at the time, all of whom escaped in safety, most of them hatless and still wearing their headgear receivers.

There are at present seven exchanges in the Paris area, of which the Gutenberg was the most important. The building was substantially constructed of stone and iron, and none of it appears to have fallen in, although much damaged. The main frame, with capacity for 40,000 lines, and power plant for the magneto sections, were located in the basement. On the first floor was the trunk lines switchboard. On the second and third floors were the older sections, while on the fourth floor were the new common battery sections and common battery accumulators.

The construction of the exchange was begun about twelve years ago, paraffin cables being used. Recently some of the magneto sections were provided with common battery cord circuits, but the multiple equipment and cables were not replaced. A central battery extension had just been installed on the fourth floor. It was brought into use on Aug. 20, and the intention was to gradually transfer the subscribers from the older sections on the second floor to the common battery sections on the fourth floor.

Steps are rapidly being taken to establish temporary service. The National Telephone Company on hearing of the disaster at once telegraphed the French Government with an offer of men and stores, which was readily accepted, and in spite of the time required for laying a large number of cables it is hoped the telephone service will be reinstated in a short time for a large number of subscribers.

BRIGHTON STAFF BENEVOLENT SOCIETY.

ON Sept. 9 a meeting of this society was held, when Mr. C. F. Moorhouse, District Manager, was elected president and trustee, vice Mr. F. W. Taylor transferred to Manchester; Mr. D. Wallace a vice-president in place of Mr. Moorhouse, and Mr. W. Dowman a vice-president in place of Mr. J. G. A. Ewing.

A QUESTION OF TELEPHONE ETHICS.

UNDER the heading "A Moral Paradox," M. G. A. de Caillavet contributes to the Paris *Figaro* the following entertaining article on a not altogether unfamiliar point of telephone ethics:—

We all know the story of the Chinese mandarin, the famous mandarin, who, if you merely wish it, will instantly meet his death, leaving you heir to an enormous fortune, without your incurring any responsibility whatever for the murder which you have mentally ordered.

Would you order it?

This is a little moral problem, the solution of which would not generally, I fear, be to the credit of humanity.

Are there many of us who would refrain from committing an immensely profitable crime, if we should have to answer for that crime only to our own conscience?

I know not what your opinion may be. Mine is that each conscience has for its host most unlimited indulgence. Our conscience is not our judge, but our comrade. And each one, I think, would kill his mandarin.

I admit such a theory is not comforting. But then is not pessimism in high fashion just now? I happened to witness the other day, by pure chance, a little incident, which, as far as it went, certainly confirmed my pessimistic views on human nature.

I was visiting an elderly lady friend of mine, an old lady of most rigid principles, in short, an extremely correct and fastidious old lady. During my visit she tried to use the telephone. This fact alone sufficiently indicates the astonishing innocence of the dear old soul. Naturally, nothing happened; nobody replied to her repeated calls, and she did not seem to mind. We chatted away, and she kept on turning the handle of the telephone. (This reminds me that I should inform my readers of the recent invention of a young engineer. He has had the brilliant idea of adapting to all telephone handles a gearing intended to collect the energy generated daily by each of us when we uselessly and tirelessly grind away at this odious machine. He stores electrically the energy produced and so obtains a supply of power sufficient to light his apartments. According to the young inventor, the useless calls for the telephone exchange represent daily, in each Parisian establishment, about seven horse-power, and it is incumbent on science to make use of this.)

But to come back to my distinguished old lady, with whom I continued to chat. She was holding to her ear one of the receivers. All of a sudden she made me a sign to be silent and then to come to her. It seems that by chance she had been connected to a line which was in use and was carrying a strictly private conversation of a kind which may be imagined. We listened and in a little while we had learnt a number of interesting details concerning the private life of two unknown people of different sex.

The voices ceased at last, and, smiling at each other, we hung up the receivers.

"You don't know how often that happens on this exchange," said the old lady.

"With mine it is just the same thing. Wagram is quite the equal of Gutenberg. That battlefield and that distinguished printer find common ground in committing indiscretions."

"And it is often very amusing!"

"Very. For my part I never neglect to extract the last word of these secrets which pass on the wires."

"And I also! It is one of my favourite amusements."

"But, tell me my dear and amiable friend, do you ever listen outside doors?"

"What on earth are you saying"

"Even at doors of people whom you don't know at all?"

"You are absolutely mad!"

"You do not listen at doors. I did not imagine it for a moment. Neither do I. There is in you and in me, and certainly in the majority of our friends, something which revolts at the mere idea of such an infamous thing."

"Certainly."

"And yet you, I, and the majority of our friends never hesitate a moment in listening to other peoples' conversations on the telephone. We regard that as being so harmless that we think nothing of repeating what we have heard and no one says a word of

blame. Nevertheless, it is exactly the same thing. To listen at the door only differs from listening on the telephone, because a keyhole is not the same shape as a telephone receiver. How is it then that one of these two things seems ignoble and the other amusing?"

"Well, do you know, I had never thought of that."

"Nor I either. For that matter it is rare for a Frenchman to think of things before speaking. It is a part of our race to reflect after talking. But here is the question quite plainly: Why of two perfectly similar actions is one contemptible and the other not at all? For my part I can only see one reason; that is that in listening at doors one runs the chance of being caught, whereas in listening on the telephone there is no risk at all. It appears then that the rules of good breeding and the rules of morality, which we are taught, just like the rules of hygiene and the police regulations, which are imposed on us, have for their object to save us annoyance or even to save us from punishment. Children and men are taught that it is bad to do something or other; that simply means that it may have a bad result for them if they do it. Legislators, priests and governesses are people who have lost their illusions and who know well that every man would ask nothing better than to kill the mandarin."

"But my good friend you are an anarchist!"

"That is what I have just discovered."

A TELEPHONE HEROINE.

By E. M. Buckland.

There's a tale from over the ocean of a deed that was nobly grand,
But I would that the story of it might be writ by a worthier hand.
How a cloudburst came to Folsom, but half the town was saved
By the telephone operator who its awful fury braved.

"Hello! Hello! Is that Folsom?" The call came clear that day:
"Fly for your life to the mountain, a cloudburst comes your way,
"Passing us close but travelling along at a fearful rate
"To Folsom. You've twenty minutes, not more as I calculate."

She sprang to the window, gasping, "Have mercy, gracious Lord,"
Below lay the quiet township. She turned again to the board.
With trembling voice and fingers she called them one by one,
Till forty men in Folsom were bidden be up and run.

"Hello! Hello! D'you hear me? Up if you value your lives,
"A cloudburst's coming over. Off with your children and wives."
And the fortieth man had answered, she rang up forty-one—
But the storm had struck the cottage and her noble work was done.

The storm has passed. Day and night they are searching with bated breath
For the girl who died in harness at her post, a soldier's death.
Twelve miles below in the valley they find her cold and dead,
Her battered and bent receiver still fastened upon her head.

She was only an operator, no heroine out of a book,
But Folsom will long remember the name of brave Sarah Rooke.

AN APPRECIATION.

The following is a letter received from a West Yorkshire subscriber which from its extremely complimentary tone may be of interest.

It is the more valuable in that the writer is a medical man, and medical men are generally somewhat exacting in their telephone demands.

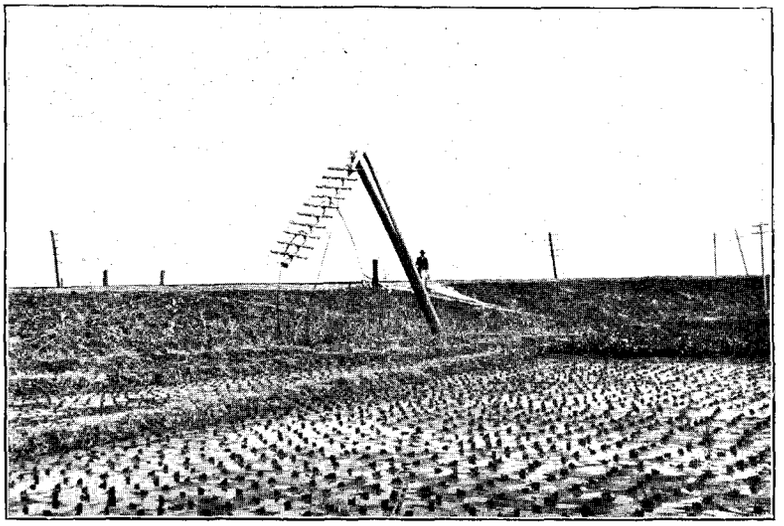
"Enclosed please find cheque for my telephone. I wish once more to add how very attentive they always are at the exchange, and I am certain we could not have a better service.—Yours sincerely."

WORDS SPOKEN OVER TELEPHONE CANNOT BE A BREACH OF THE PEACE.

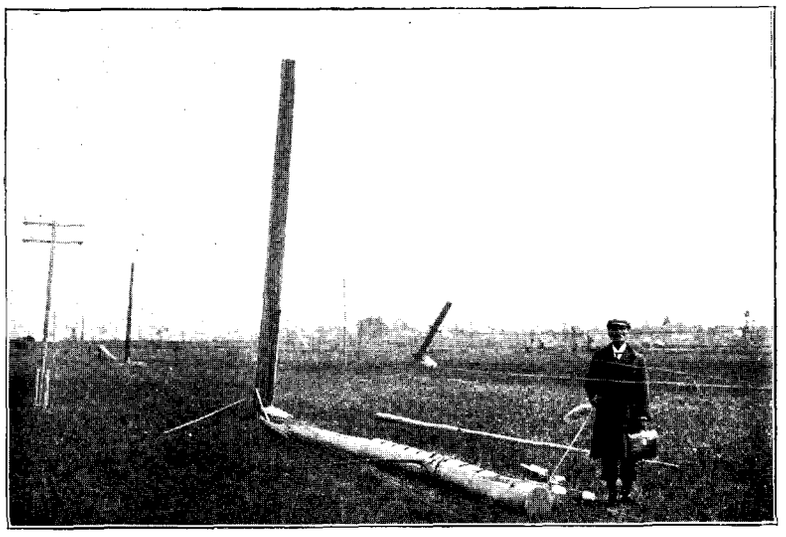
At Winona, Minn., it has been held by the Municipal Court that no action lies for breach of peace where the words were spoken over a telephone, although such words would be actionable if spoken directly to the person addressed. The reason given is that by the time the person offended has reached the person speaking he would have time to cool off. The action was brought because of abusive words alleged to have been spoken by Lawrence Kreidermacher to Mrs. Mary Simon over the telephone.—*American Telephone Journal*

SNOWSTORM DAMAGE IN JAPAN.

We, in this country, who suffered from snowstorms late in April, are interested to learn from a communication received from Mr. Riuji Nakayama, of the Imperial Department of Communications, Tokyo, that far away in Japan they also had somewhat



similar experiences, although, unfortunately, the Japanese plant suffered severely, the telegraph and telephone lines in the neighbourhood of Tokyo and Yokohama being interrupted for several days.



We publish copies of two photographs with which Mr. Nakayama has kindly furnished us, and these give some idea of the havoc caused by the storm.

ANSWERS TO QUERIES.

With regard to "Learner's" further enquiries, the line between Boston and Omaha consists of copper, weighing 435 lbs. per mile.

There is no loading on the line, but a special device for relaying the speech waves is inserted at two points. They are spaced so as to divide the line into three equal portions. By this method the transmission is brought well within the commercial limit

A FURTHER NOTE ON REDISTRIBUTION AT THE BRISTOL EXCHANGE.

BY A. E. COOMBS, *Exchange Manager*.

MAY I be permitted to give as briefly as possible the sequel to my article in the September issue of the JOURNAL on this subject.

The plan of campaign—what had been done and how done—was outlined and explained, but no actual results were given because, when it was written, the scheme had only just been completed, and it was desirable thoroughly to settle down to the new conditions before submitting the results. These have been most satisfactory, as the subjoined traffic figures and curves will show. It will be seen that on the unlimited sections the average number of calls dealt with per busy half-hour per operator varies between 116 and 99, a difference of seventeen only. On the mixed positions (unlimited and limited), and omitting positions 17 and 18 (as it is obvious that the learner on No. 18 was the cause of the senior on No. 17 having an average of 100) the calls vary from 90 to 78, a difference of twelve only, and on the automatic box positions the figures are 72 to 61, a difference of eleven.

Then taking the average number of cords per position. On the unlimited sections the number of pairs in use varies from seven to five; on the mixed sections the figures are six to four; on the boxes five to three.

These facts speak for themselves, and show that the distribution has proved equal to all expectations. This forms another strong case for the combination of experience and figures, and shows that the senior staff at the Bristol Exchange were thoroughly conversant with the average calling rates of the most used lines.

It will perhaps be necessary to explain the schedule below.

The statistics were taken on the "A" positions during the two busy hours of one day only. Other figures have been obtained which were much on the same lines, but instead of giving the average of several records one actual record is quoted, just taken at short notice and under ordinary working conditions.

This schedule shows the maximum and minimum of calls (valued) dealt with at each position during the two busy hours (taken in half-hours), an additional column being utilised to show the average number. It also gives the maximum, minimum and average number of pairs of cords in use at the various positions during the same period, this count (for the cords) being taken every fifteen minutes.

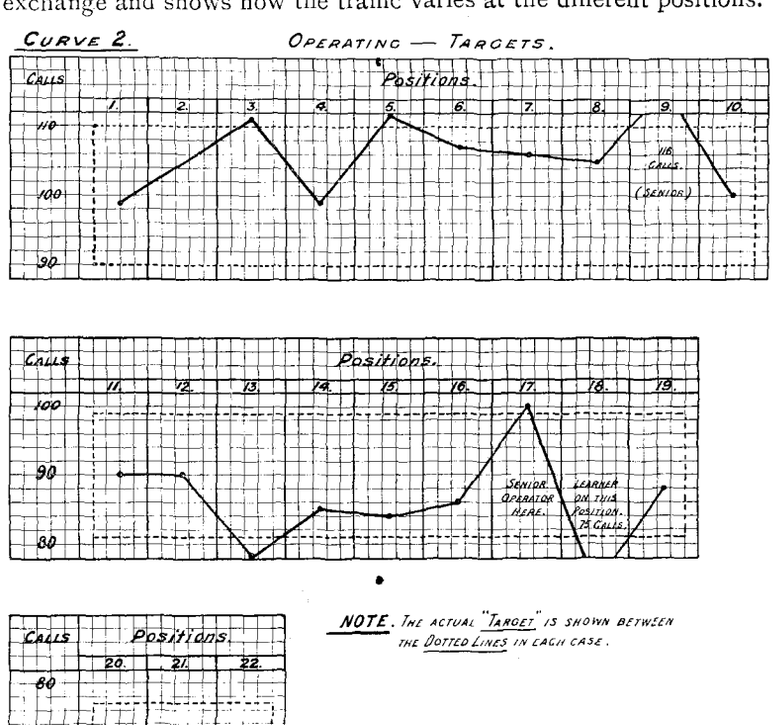
The curve shown below gives an operating target for the exchange and shows how the traffic varies at the different positions.

SCHEDULE I.

	CALLS.				CORDS.		
	Record of calls, 2 busy hours.				Cords in use, 2 busy hours.		
Position.	Maximum calls per half-hour.	Minimum calls per half-hour.	Average calls for 4 half-hours.		Maximum in use at any one time.	Minimum in use at any one time.	Average No. in use, 2 busy hours, 8 counts.
1	120	90	99	Unlimited rate subscribers only.	8	3	5
2	126	91	105		9	3	6
3	130	95	111		11	4	6
4	111	78	99		7	3	6
5	123	101	112		10	4	6·5
6	128	87	107		7	3	5
7	127	91	106		12	4	7
8	132	75	105		7	2	5
9	126	100	116		9	4	7
10	108	98	100		7	3	6
11	98	78	90	Unlimited and limited rate subscribers.	7	2	4
12	107	74	90		8	1	4
13	91	43	78		8	3	5
14	97	80	85		8	3	6
15	93	64	84		7	1	4·5
16	98	50	86		5	3	4
17	111	75	100*		9	2	6
18	78	66	75†		6	2	4·5
19	102	78	88	Auto. box & limited rate subs. only.	10	1	4
20	83	65	72		9	2	5
21	69	46	62		8	1	4
22	63	44	61		4	2	3

* Senior. † Learner.

CURVE 2. OPERATING — TARGETS.



NOTE. THE ACTUAL "TARGET" IS SHOWN BETWEEN THE DOTTED LINES IN EACH CASE.

A fair average load for an operator dealing with unlimited traffic only is 100 calls (valued) per half-hour; for a mixed service 90; for auto box service 70. An allowance of 10 per cent. is, of course, made on these figures (100-90-70) for traffic variations.

The figures have been taken from the automatic register position meters, which have been fitted to all the "A" positions at Bristol, and on which all calls, day and night, effective or ineffective, are registered.

"ELECTRICAL ENGINEERING."

WE are informed that as from Oct. 1 the proprietors of *Electrical Engineering* have decided to reduce the price of that paper from 6*d*. to 1*d*., but that the standard of the paper will be retained precisely as it was for the higher price.

We take special pleasure in bringing this announcement before our readers. *Electrical Engineering* in the past has been a thoroughly high-class paper, and in particular has contained quite a number of special articles on telephone subjects. But in addition we particularly desire to point out the necessity of telephone engineers, whatever they may for the moment specialise upon, keeping in touch with the developments and modes of thought in other branches of the industry, and one of the best ways of doing this is to read regularly some of the engineering periodicals. With the price of a first-class paper of so low as 1*d*. per week, there ought to be but few who are reckless enough to think they can afford to neglect this means of advancement, and we trust that there will be many readers of this paper among the Company's staff.

CABLING THE VALLEY BRIDGE, SCARBOROUGH.

BY W. CASTLETON, *Local Manager.*

To increase the underground capacity on the South Cliff section, a 200-pair dry-core lead-covered (armoured) cable, 208 yards long, has been erected over the bridge spanning the Ramsdale Valley, known as the Valley Bridge.

The bridge, which is a halfpenny toll bridge, consists of three spans, 180 feet each, crossed by means of wrought-iron trellis girders, the roadway being on top of the girders, and the footway supported on overhanging brackets. The approaches consist of five stone arches of 30 feet span, together with embankment between masonry retaining walls. The whole length of the bridge is 800 feet, and the roadway at the centre is about 80 feet above the valley. The span of the main girders is greater than in any existing viaduct over dry land, and to this, no doubt, the bridge is indebted for its elegant appearance. The trellis girders at this elevation are supported on pierced towers of masonry. The unusual dimensions of the girders arise from the fact that they were originally designed for the purpose of crossing the Ouse at York. The length with the ironwork is 550 feet, making, with the arches, a total length of 800 feet. The clear width of the bridge is 30 feet. It was built by

FIG. 1.

Robert Williamson, Esq., and opened on July 1, 1865, by the Valley Bridge Company, John Heigh, Esq., chairman. It is stated to be one of the finest bridges in Europe.

The above notes enable one to form an idea of the work undertaken and completed in the space of four days, as we were compelled to put the cable out of sight and attach it every nine feet by means of clips to the girders supporting the roadway, and on the inner side of the brackets supporting the footway. At each end the cable left the ironwork and was clipped to the stone piers by means of a spike clip. The work commenced on June 15, and included carting and getting into position all the necessary tackle, putting up and taking down scaffolding, erecting and cleating cable to iron and stonework of bridge, putting ends of cable through stone walls and into chambers built in the stone piers. First, 30 scaffold poles were spanned through the trellis work under the bridge, distant from each about 20 feet, to support the cable when drawing over. To prevent these from sliding, they were lashed to each side of the bridge. (Fig. 1 shows how this was done.) The drum and cable, weighing $1\frac{3}{4}$ tons, had to be lowered down a very steep gradient, known as Panting Hill, and to do this it was necessary to place a 28-feet pole across the road in front of the park gate pillars, and lower the drum gradually by means of blocks and ropes. It was then placed in position under the north end of the bridge; a crab winch was placed under the south end of the bridge, and two stay blocks with one crossed over them, were buried to a depth of 6 feet. Four stays were attached to the blocks, each composed of six strands of No. 8 iron wire, and these were fastened to the feet of the winch to prevent it from lifting, the pull on the draw rope being almost vertical. No rollers or pulley wheels were used; instead, one man with blocks and tackle was deputed to hoist the cable and bear the weight between the drum and the first scaffold pole, until the cable was fairly started. The chalk coating on the cable did all the lubricating necessary.

Two men were stationed at the drum, one man on a ladder lifting and easing cable over the first scaffold pole, four men were placed at 30 yards to 50 yards apart on trellis work under bridge to guide cable on scaffold poles, one man following cable grip along bridge and guiding where necessary, and four men worked the crab winch until the cable was halfway across, and five after. The

FIG. 2.

actual time taken to draw the cable across was three and a quarter hours.

The first grip used, size $1\frac{3}{4}$ inches, began to tear off the canvas covering of the cable, and this was noticed by the man following. A change was made, and a grip, size $2\frac{1}{2}$ inches used, which held satisfactorily until the full length of cable was hauled over. Working from the centre, the cable was then lifted from the scaffold poles into position near the bridge beams and lashed there, and the clips were then attached.

In Fig. 2 the cable and clips can be seen in position inside the trellis work and under the deck of the bridge. A test of the cable taken at a later date showed its condition to be very satisfactory.

No hangers, ladders or planks were used on the bridge, the men being able to get along the flange of the girders supporting the trellis work.

CHECKING OPERATORS' RECORDS OF MEASURED RATE CALLS.

BY E. J. JOHNSON.

IN magneto exchanges considerable difficulty is experienced in making an accurate check of the operators' record of calls on the measured rate lines, owing to the difficulty of identifying individual tickets. Any inspection of tickets or clearing positions of tickets, previous to starting an observation, informs the supervisor and, most probably the operator, that a check is being made. This puts all concerned on their guard, and the check is not made under normal conditions. In order to avoid this the following system has been adopted in the Central Exchange, and has been found to work well:—Between 9 a.m. and 6 p.m. tickets are cleared at the commencement of each hour precisely from all receptacles in the positions, and each hour's tickets kept together, the *modus operandi* being as follows:—

At 9 a.m. all positions are cleared of tickets which are placed in the ticket box in the compartments numbered to correspond

with the operators' positions from which the tickets have been cleared. On the top of the tickets in each compartment is placed a card marked 9 to 10 a.m. Any tickets cleared before 10 a.m. are placed on the top of these cards, and at 10 a.m. all positions are again cleared of tickets, and on the top of these tickets is placed another card marked 10 to 11 a.m. This goes on through the day until 6 p.m. Thus between the cards marked 9 to 10 a.m. and 10 to 11 a.m. are all the tickets for the positions that have been made out between 9 and 10 a.m., and similarly for each hour during the day.

The observation clerk begins his observations at the commencement of any hour, and can leave off at the end of any hour, it not being necessary to make any arrangements for the positions to be cleared of tickets at any particular time or for anyone to know that a check on the recording is being made.

When checking tickets with the observation results, it is only necessary to sort the tickets for the hour or hours during which calls were observed. This saves considerable time and trouble, especially when the observation is spread over several hours and in the case of small users, who frequently have intervals of two or three hours between calls. The separating cards are mostly readily made by covering the brown cardboard backing of the tickets with white paper and writing the hours on it. Since this system was adopted the checking of the operators' records has been much more simple and reliable.

The advantages of this method are that it (1) enables tickets to be identified; (2) ensures regular clearing of tickets from positions; and (3) keeps supervisors and operators constantly reminded that their records are being checked, and are consequently more careful.

This method could also be adopted for sub-exchange tests, by a service inspector or other official. Calls could be originated by the subscriber in the presence of the service inspector, and the time noted. A little judicious enquiry would show how many calls had been made, or would be made during the hour and at the close of the test, the tickets for the hour could be sorted and results compared.

The regular clearance of tickets and an occasional inspection would let the operators see that their records could be checked at any time. The moral effect of this would be to increase the accuracy of the records.

During a recent month the observation clerk reported that 99·1 per cent. of tickets were made out, showing an improvement on the results obtained before this method was adopted. The supervisor for the measured rate positions states that the regular and punctual clearance of positions does not entail any additional work, and that the moral effect is to cause the operators to exercise greater care with the tickets in all respects.

EXPERIENCES AT A CASH COUNTER.

By JAS. F. SCOTT, *Cashier, Glasgow.*

"How delightfully simple! Nothing to do all day long but accept money."

Such, I suppose, is the cash clerk's work as seen through the eyes of the uninitiated. But it is not always so "frightfully fascinating." What of the balances that will not balance? What of those strenuous days following the despatch of the monthly fee accounts, when cash flows in more quickly than the busiest fingers can write receipts?

It is not that phase of the work I would speak, however, but rather of how it brings those of us whose duties lie behind the counter in touch with the telephone outer world—the subscribers; how we experience their humours and ill-humours, their whims and foibles, and occasionally their stupidity and "cussedness."

There was the messenger boy, obviously sent by a humourist of the mild type, who paid a fee account for one penny with a five-pound note; there was the young lady from the West End who called with a small account, and tendered in payment a heterogeneous assemblage of coins, including sundry threepenny pieces and two farthings; there was that other young lady who failed to see the cash counter ten yards long, straight in front and crowded with customers, and who wandered into all sorts of unlikely corners before she spied with an "Eureka" glance the proper place for payment; there were and are those who, perhaps noticing a "Post Office manner" creeping over us, desire us to despatch telegrams; and there are other dreamers who at various times proffer payment of gas, electricity, water and Post Office telephone accounts.

While patient painstaking will usually pacify even the most irascible, there are times when unorthodox methods become not only desirable, but even essential. A subscriber entered the cash office of a northern district some time ago, and placed the familiar "final notice" on the counter. He then took off his jacket, rolled up his sleeves, and in a tone full of menace demanded that the clerk who cut off his telephone be brought before him instanter. The clerk in question was out; but nothing would convince the would-be pugilist that this was other than a feeble method of screening the culprit. Finding his expostulations useless, the cash clerk tried a subterfuge. He promised that the responsible party should be sent to the subscriber's office, but at the same time threw out the hint that a "scrap" would be warmly welcomed by ——— (here he gave the name of a noted local "bruiser"). The ruse was successful. The probability of retaliation was apparently outside the subscriber's calculations. His ire speedily subsided, and he paid the account.

In the same district the cash clerk also acts as call office attendant. During a recent week he had a regular customer in the person of a lovesick young man, who spent the greater part of every day in passing trunk calls to a neighbouring town, and who could be heard through the partition for ever apostrophising his darling. A week or two passed, and the cash clerk had almost forgotten the incident, when he was reminded of it in a rather curious way. A youth had been brought before the sheriff of that neighbouring town on a charge of disturbing the sleeping inhabitants at midnight by throwing gravel to his sweetheart's window. The name coincided with that on the call office sheet, and there could be no doubt that the lovesick worshipper was the victim. He had been born a few centuries too late.

Some years ago a strange experience befel one of the Glasgow cash clerks. An old lady entered the office, and, in all sincerity, informed him that blue devils were coming out of the wires which crossed her house. At first he thought that the blue devils owed their existence to some other fluid than the electric; but, on her reiteration of the same complaint, he came to the conclusion that it must be her eccentric way of reporting a line fault. The line was found "O.K."; but the matter was not yet at an end. Again and again the old lady called to inform him that the blue devils still haunted the wires, until the growing conviction became a certainty—she was insane. This conclusion was verified by her sister, who, discovering the reason for her absences, suggested that the old lady be humoured in her hallucination. The clerk discerned a diversion in this, and subsequenly devised many expedients for bringing the devils to book. Nothing would snare them however, and the devil-catcher's inventive powers having reached their limit, he used to dodge when the old lady was approaching. As she would confide her grief to none but this especial clerk, her visits eventually ceased and she was heard of no more.

On a very wet day last winter a poor little laddie came into the cash office. His feet were bare, and, although his costume was not of the style "Directoire," still there was little enough of it. He was so small that he would have been quite hid in the shadow of the counter; so he stood in the middle of the floor and mutely held out his hand. A collection was made, and the little lad departed with radiant countenance. Two or three days after the weather was again torrential, and, to our astonishment, in came the little lad, this time with an even smaller personage as ragged as himself, presumably his sister. Again a collection was made and handed over with the warning "Never come back again." Sure enough, next rainy day back came the twain in the same state of *dishabile*, but we had had enough and sent them away empty handed. Perhaps never have the Telephone Company's premises more narrowly escaped being turned into a charitable bureau.

Truly, experiences at a cash counter are many and various, and the cash clerk who would be perfect in his duties must needs possess many attributes. The tact of the politician, the *sang froid* of the philosopher, and the endurance of the stoic must all be his. True, there are few individuals who possess more than one of these qualities; but then how few of us are perfect!

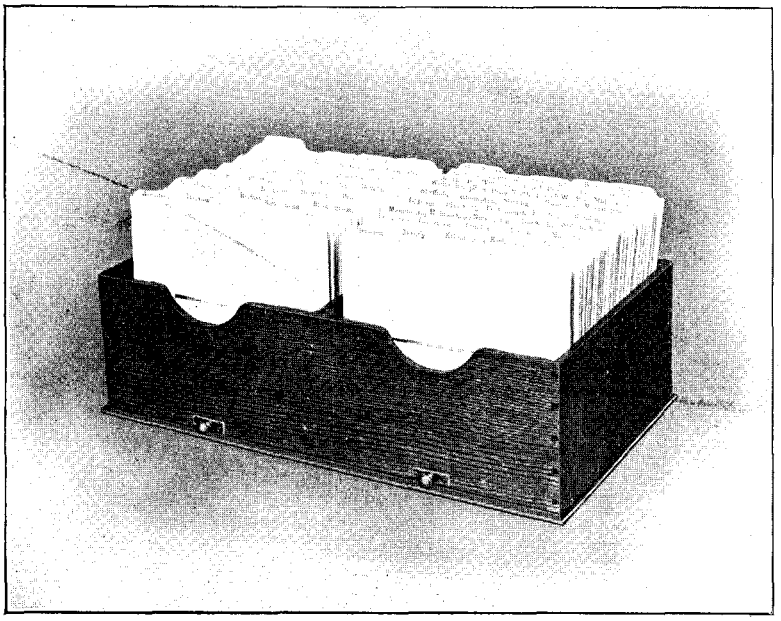
OFFICE ECONOMIES.

By P. H. C. Prentice.

Owing to a considerable extension of the office accommodation in the Engineer-in-Chief's Department recently, it became necessary to undertake in several cases a fresh lay-out of the office equipment, and the consideration the writer had to give to the matter, so far as his own office was concerned, showed him amongst other things, that several economies could well be effected. Two instances of this saving he ventures to give as not uninteresting to others.

In most offices where there is a large number of letters going out nightly, some sort of arrangement is almost universally employed for getting together the letters for certain places or correspondents, and this generally takes the shape of a set of pigeon-holes. For some purposes pigeon-holes may be indispensable but this does not apply to the handling of letters for post. The chief objection to a pigeon-hole system is that it is inelastic, imposing as it does a fixed limit of space for every compartment.

In common with most offices we have had for years a system of



pigeon-holes—60 in all—occupying a space of 13·5 cubic feet. It occurred to the writer that this arrangement might well be supplanted by something less cumbersome, and, applying the vertical principle, he designed a distributor to meet the requirements of the case, and special guide cards, illustrations of both these appear below.

The postal clerks have to dispose of letters in two's and three's throughout the day as they come along, and, with the pigeon-holes, this necessitates each batch being folded before it can be placed in a compartment. With the new distributor this folding on each occasion is abolished, the clerks dropping the letters in, unfolded, against the proper guide, the folding taking place once only, at the end of the day. The special guide card was designed with the view that any letters left in the distributor should automatically disclose their presence, the position and size of the slot being determined so as to provide against the smallest postal matter getting in the worst position.

At the end of the postal work, the clerk pushes the guide cards forward on the rod running through them and instantly sees if anything is left behind. Failing this device, it would be necessary for him to look through each compartment by opening the guides so as to absolutely ensure that every letter had been removed.

Contrast the space occupied by the old arrangement and the new:

Sixty pigeon-holes = 13·5 cubic feet.
Vertical distributor = 1 cubic foot
(at present with 72 guides).

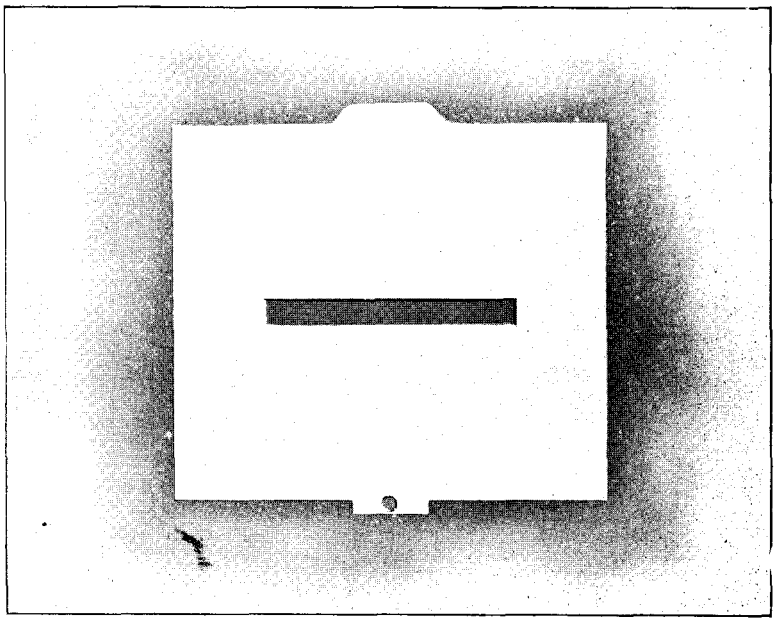
The new arrangement shows a space saving of 93 per cent.; it works smoothly, and means some labour-saving besides.

The application of the vertical idea, as instanced above, the writer applied again in the case of the filing of returns. For many years we had had a large cabinet of 70 drawers. With the Engineer-in-Chief's permission he cleared this cabinet out of the office, having the returns filed vertically under the necessary guides.

Again contrast the space of the old and new arrangements:

Horizontal filing cabinet = 41 cubic feet.
Vertical file ... ... = 2·4 cubic feet.

The old horizontal equipment, the body in white wood stained, cost £17—the vertical file in walnut £3 (a first cost reduction of 82·5 per cent.). Then there is being effected a considerable economy in working cost, for, as tests have proved, the returns can be got at in 50 per cent. less time on the vertical than on the horizontal plan. This is not surprising if regarded merely from the drawer-opening point of view. You require 70 returns from different centres; with the horizontal arrangement a certain amount of time was spent on opening and closing 70 drawers—with the vertical plan the time on this operation is obviously reduced to one-seventieth.



At first sight it may appear to some that this saving is merely in the filing clerks' time, but consideration will show that the economy is not confined to that, but is far-reaching, extending, of course, to the principals who require information from the returns. Besides all this is the space economy of 94 per cent. in favour of the new plan.

I have deemed it worth while to write on these two points, thinking that what works well and profitably in our own department ought to prove its value in many other places throughout the kingdom.

I know well enough that it is not always feasible to get rid of old appliances just because something better is available, but the ringing out of the old methods should be kept in mind, and, directly opportunity offers, a clean sweep should be made in favour of the new, and the horizontal method of handling papers should be cleared out as completely as possible, as, apart from the economy to be effected in floor and air space with the vertical arrangement, there is the additional satisfaction of better work at less cost.

One can scarcely help becoming an enthusiast in methods which make concurrently for economy and efficiency, and it is with feelings of compunction that one's thoughts revert to those years when one allowed the old inefficient methods to grow and multiply without an attempt at uprooting them.

. . . But this is confession, and I will go no further.

A GERMAN WRITER ON TELEPHONE RATES.

By W. H. GUNSTON.

REFERENCE has already been made in the JOURNAL to a series of articles on "Telephone Tariffs" which have been running for some time in a German contemporary, the *Zeitschrift fur Schwachstromtechnik*. The question is at present a prominent one in Germany in view of the proposals of the Government for the establishment of a measured rate tariff on the lines indicated in our February issue. The writer of the articles summarises his conclusions somewhat fully under twenty heads, with many of which all telephone men will be in entire agreement. Such, for instance, as—

"(2) The use made of the telephone in a country is principally a question of the condition of economic life and of its accessibility. The latter is determined by the price of the connection and the usefulness of the service."

"(3) The use of the telephone is a chief factor in the economic life of a country, and the new regulations will affect the wellbeing of the country, either favourably or unfavourably, most deeply for many years. It is a national affair of the first rank."

"(4) A reform has now become necessary, because the existing tariff deprives a large proportion of the population of the use of the telephone, because those connected are unequally and unjustly burdened, and because the revenue is too small." (The latter consideration refers, of course, to German conditions.)

"(5) The new tariff must therefore—

(*a*) Increase the accessibility of the telephone materially.

(*b*) Remove the existing unfairness of the large user paying too little and the small user paying too much.

(*c*) Guarantee a moderate revenue to the State."

"(6) Further it must fulfil the condition that it must not be built up upon the momentary condition of the technical and administrative conditions of the country, but must have regard to the general condition of telephony and take into consideration progress which may be expected in the future."

It is pointed out that the smaller users of the telephone who only make a few calls during the day already include half the total number of subscribers. If the telephone by reason of increased accessibility becomes an actually universal means of communication, the small users will in a short time form 75 per cent. to 90 per cent. of the total telephone subscribers. It therefore follows that the tariff must take its shape in accordance with this vastly preponderating number of small users.

This is also true. In anything like a universal extension of the service the small, or at least the moderate, users must constitute the vastly preponderating body of the subscribers, and to fix the rates at such a figure as to enable the large user to make his average number of calls free, it becomes necessary to maintain a tariff which not only keeps the majority off the telephone altogether, but unfairly benefits a few at the expense of the many. Any administration which does so acts in opposition to its own interests, because not only does it limit the extension of the telephone and warn off a multitude of would-be subscribers, but it also encourages a one-sided, plethoric traffic, difficult to cope with, and an unscientific and unremunerative expansion of the telephone, in the direction of overloaded direct lines and ineffectual extension stations.

As regards a measured rate tariff, and especially that proposed by the German Postal Administration, the writer gives figures showing that it would cost no more to the administration to give a subscriber six metres distant from the exchange 7,540 calls free than to give a subscriber six kilometres (three and three-quarter miles) distant 400 free calls; and both would pay the same rate under the new German tariff. In view of this variation he goes on to say that the payment per single message is objectless, and that as the cost for wires, apparatus, etc., arises whether the line is used or not, there can be no tariff which is exclusively based on a unit charge for each call. Every measured rate tariff is of necessity a flat rate with or without regard to the amount of use of the single connection.

It would appear to be immaterial whether the annual lump sum payment necessary to every measured rate does constitute a kind of flat rate or not: it is merely a question of nomenclature; but the other objection to the measured tariff, that of mileage, has little force in this country where the standard rates cover the distance of a mile from the exchange and above that distance are graded for each quarter-mile. The question of the proper mileage to be allowed without extra charge depends finally on the average distance of subscribers from the exchange, and can be best determined by the administration concerned. It must be borne in mind, however, that a subscriber's line to the exchange is used not only by himself, but by all other subscribers on the system who wish to communicate with him, and a man with a line only a few yards long does not confine his calls to similar short lines but has the use of subscribers' lines of all lengths whenever he makes a call. It may further be pointed out that whilst the majority of subscribers are within reasonable distance of an exchange and only a small minority require long and expensive lines, the average variation in the cost of connecting them cannot be compared with variations between the cost of giving service to the large and small user. Not only is the variation between the moderate and the heavy user very great, but it is important to note that there would be no really small users (corresponding to the subscribers situated a few yards from the exchange) to be included in the comparison under the old-fashioned rate, simply because they could not afford to have the telephone at all.

Under the heading (15), the writer puts forward in detail his objections to the unit of a charge per call. He says: "(*a*) It unnecessarily burdens one-sidedly nearly one-half of the subscribers, namely the calling subscriber, so that one and the same heavy traffic would cost one subscriber very dear and the other very cheap."

Surely a system under which each pays for his outward calls and gets his inward calls free cannot be called one-sided. The case mentioned could only arise where the heavy user did all the calling up, and his clients were chiefly small users.

He complains further (*b* and *c*) that traffic to extension stations is not taken into account in the tariff. But calls which throw no work on the exchange are very properly not charged for. It is here, however, that German conditions differ from our own. With us the free internal calls are one of the advantages of the private branch exchange which does so much to improve the exchange service generally, and which does not seem to be provided for in the new German tariff.

The writer says: "(*d*) It assures no improvement of the traffic by the limiting of ineffective calls." With this one must totally disagree. In the first place, the tendency of a measured rate is to eliminate all unnecessary calls, and in the second, even although offering no private branch exchange rate, the new German tariff limits the use of one instrument to 10,000 calls per annum, so that the subscriber who wants to make 50,000 calls per year has to pass them over five lines instead of one. This, it is needless to observe, is greatly to the benefit of the service, and allows incoming calls a chance of becoming effective. Every ineffective call, besides meaning a possible loss of business to the subscriber, is so much needless work on the part of the operator, and it is one of the chief recommendations of the measured rate that it minimises the number of ineffective calls, leaving the operator almost free to deal with effective calls only.

"(*e*) It causes an indubitable deterioration of the service in consequence of a noticeable increase of work on the already overloaded exchanges and an unavoidable delay which would arise from complaints." Whether the German exchanges are overloaded or not is, of course, a local and not a general question; but it may be observed that the work of recording calls is more than counterbalanced under measured rate conditions by the saving of labour on ineffective and unnecessary calls.

It may be wondered what alternative the writer proposes, seeing that he favours neither a call-unit tariff nor an unlimited tariff where subscribers "are unequally and unduly burdened." In paragraph 16 he says: "If the unlimited annual traffic is too large a unit for calculating the payment, and the single call is too small, there only remains a more or less large number of grades of traffic as the basis of a tariff. That is, a graded flat rate according to more or less important variations."

He thinks the following tariff would be justified:—Two, four and six-party lines at £3, £2 10s. and £2 per annum respectively. He then outlines a graded flat rate extending up to £15 for 30,000 calls, and £17 10s. for 50,000 calls! Yet he has complained that the proposed Government rates "do nothing to ensure the improvement of the traffic by the limiting of ineffective calls." Fifty thousand calls over one line in a year! Assuming that the subscriber has the same number of inward as of outward calls, he will be trying to get about 330 calls over his line per day, or nearly 40 an hour. It needs little imagination to conceive the number of times his clients will have to ring him up in order to find his number disengaged, the useless work performed at the exchange and the strictures passed on the administration. The question of inward calls often seems to be overlooked by critics of telephone rates, yet, of course, they play an equal part with the outward calls in the loading of a line. Moreover, it must not be supposed that traffic flows at an even rate over nine or ten hours; probably the bulk of it arises in the four busiest hours. The "increase of work to the overloaded exchanges" which the writer fears, under the proposed new rates, would progress under his suggested tariff scheme by leaps and bounds! Finally, a system of extensions is proposed. These do not, however, relieve the direct lines, but tend to decelerate the service and are vicious in principle. Apart altogether from the difficulty of arranging and keeping the subscribers within their grade, it is not easy to see what advantages the graded flat rate has over a call-unit tariff; on the other hand the drawbacks are both obvious and serious.

REMINISCENCES OF THE STAFF.

By L. E. Wilson (*late Manchester and Liverpool*).

There is something very fascinating and uncanny in the reading supplied in the personal column of the Journal. Looking at old photographs and turning over old papers will produce the same effect, and it only wants a meeting of old colleagues to prove the rule which governs these conditions. The longer the service the more readily the past is associated with the present, and the movements of old friends is bound to recall incidents connected with the past which are in many cases worth recording, for the early days were pioneer days, when standardisation and bottled instructions were not so much in evidence. It is therefore only fair that some allowance should be made for the difficulties and conditions which existed at this period. There is no denying the interest, however, which these occasions excite, no matter whether they be gay or grave, and if these lines should meet the eye of any of the principal actors let them remember that it was years ago, and they were younger; for as the subscriber said when asked to speak "plainly," "By gosh! if I do, someone will know about it." Under these terms I risk it and await developments.

Hyam Hall, District Manager of the B. Division observed a man, in spite of many warnings, smoking in the stores, so that there was nothing else to do but to carry out his threat. Calling him into his office he paid him off, heedless of all protests; four days at four shillings per day, sixteen shillings, "Here you are, now get!" After a while the foreman entered and ventured to ask him what was settled.

H. H.: "I paid him off, and will do the same to any other man caught smoking on the premises or on duty."

Foreman: "Paid him off! Why he was applying for a job!"

Another time a barrow was short at stocktaking, and H. H. was bent on dealing firmly with the circumstances.

H. H.: "What another barrow short? Shut all the doors. I'll have everyone searched."

The following is probably a suitable ending for this officer, the sad intelligence was conveyed in a letter signed *per pro* by the chief clerk.

Memorandum to the Secretary.

"I am sorry to inform you that I died this morning of pneumonia."

Hyam Hall,
p. p. C. D.

One of the old timers, long since "rung off," could tell a tale to suit any and every occasion. In his time few people knew what a telephone was, and he had to explain that "a telephone was a thing you talked through."

On one occasion he wanted to put a pole on some stables and the owner, in his pyjamas, objected very strongly, ably supported by a big dog (it was a retriever) and a gun, much to our friend's annoyance, who pointed out that he had a pole on Whitehall which was much admired and he ventured to call the stables incomplete without one. Oh, yes, he had done and seen much in his time; in India he had killed 99 elephants before breakfast!

Property Owner: "Now if you make it 100 you shall have the wayleave."

Old Timer: "What, sir! would you make me a liar for one elephant?"

When he did not succeed he attributed it to relationship or friendship of the property owners to someone in the Company's service, and consequently they knew too much.

No doubt many of the higher officials of to-day have in their time been sent for some "fog dust for oiling lathes," or "sky hooks for aerial cables." Well, let them admit it and remember that a man who cannot read human nature cannot manage it.

I remember a most excellent man spending some time finding a contact between one of our subscriber's lines and Marconi's "Wireless" telegraphy; that same man suggested to the storekeeper that two 8-candle-power lamps might perhaps do, as he had not a 16-candle-power—it would keep his stock right.

The opinion of the staff is not always to be disregarded lightly. I still retain a card on which is neatly printed someone's opinion of my efforts when organisation began to tell.

Motto for May:

"Time and averages wait for no man."

There is probably no other career in life which demands more patience, skill, pluck and experience, especially when emergencies demanded three months' work in one month.

Recalling a disastrous fire. The chief was soon on the spot never to leave it until everything was in order, his staff did not fail either morning, noon and night, day after day, week after week—the same faces were always present—until at last he suggested more sleep and said, "Do you know what becomes of the man who works day and night?" *Assistant:* "Yes, sir, and I trust you will be more careful." A smile finished this conversation and each returned to their work—their hobby—their life.

A good chief of gentle disposition had his own way of dealing with subscribers who were wont to use coarse words by telephone. On one occasion he went direct to the subscriber (who was well known to be the culprit) and said, "Look here, Mr. Messagerate, some blackguard, I say, some blackguard uses foul language over your telephone, and I feel sure now that your notice has been drawn to the fact, the offence will be stopped." It stopped.

The telephone service is undoubtedly the most difficult and exacting branch of the industry, and the average telephone man is more or less scientific, and if his monthly cheque is not as fat as his requirements demands he works all the harder to remedy some apparent shortcomings. Of course everyone is not of the same opinion, and I remember one young lady who altered hers. She had seen much service and progressed well for one of her sex. One eventful day she handed in her resignation and also her remarks, "Oh, yes, she would be very happy and comfortable, her job wouldn't be as difficult as mine, her future husband wasn't a scientific gentleman either; but he made over a £1,000 a year—selling eggs! that's better than all your science!"

Her smile stopped my reply—and the clock. Working off an old grudge like this must be very satisfactory, and for weeks afterwards I had serious thoughts of growing cabbages in the country.

In one of the Manchester old horse trams, the collector came round to collect fares with a tin box in which passengers dropped the exact money. A tired operator dreaming of automatic boxes, startled the other passengers one day in the following way:—

Conductor: "Put your money in please."

Operator: "One! two! Your through!"

It is not wise to stock too many nice-looking operators, they should be judiciously mixed. If they start haymaking altogether the service suffers, and it's tiresome work training new operators.

At one time it was apparently the fashion for subscribers to marry operators, but now by the look of things in the JOURNAL it appears that the staff are getting quite exclusive, and managing these matters amongst themselves—probably without permission. This is a sample of how it was carried out in the old days.

Letter from subscriber.

> Dear Sir,—I write in connection with Miss Hallo who is my *fiancée*. It is my wish to marry her with as little delay as possible, so I enclose herewith my cheque for £—— in lieu of the usual month's notice.—Trusting, etc., faithfully yours,
> I. TEST ENGAGED.

Letter to subscriber.

> Dear Sir,—Your letter and enclosure to hand. The latter I herewith return, as you have unfortunately underestimated the value of Miss Hallo's services; but if you are agreeable to double the amount your proposals will receive my best attention.—I am, your obedient servant, ——

In spite of the concession and gratuitous testimonial I did not receive an invitation to the wedding.

THE MAINTENANCE OF A CENTRAL BATTERY EXCHANGE.

BY HENRY J. HERINK.

A SERIES of short papers having been read before the Norwich Telephone Society on the "Birth and Life of a Telephone Subscriber," below is given a paper read by Mr. H. J. Herink on the "Maintenance of Central Battery Exchange."

Let me say before starting my paper, that I shall in no way attempt to write a technical account of the subject before us, but to give a brief and general idea of exchange maintenance, so as to interest all present and not only those directly engaged in that work.

After having had our subscriber connected up, the foremost thing is to ensure him an efficient service, and this can only be done by having the exchange apparatus in thorough working order. One of the most important things is the energy which enables our subscriber to call and to speak, viz., the current. A splendid organisation of circuits may be arranged, but it is all inanimate until the electricity is brought into play, and then a "dead" circuit is converted into a "live" one, ready to do the work assigned to it. Therefore, the store from which we draw this energy must be carefully maintained, and when the energy begins to be exhausted it must be replenished by means of the power plant.

The power plant generally consists of two ringing machines, two motor generators, power switchboard, fuse board and storage battery. The machines must be kept scrupulously clean and the bearings quite free and well oiled. The slip rings and commutators are to be kept level and even, and the brushes trimmed and set. The latter is very important, as an incorrect set causes loss by spark and noises on the lines, besides "ploughing" the slip ring or commutator. The pressure of the brush must not be too great, but sufficient to make a good "slip" contact. A spring balance and a list of the requisite pressures should be used in determining this. The power board consists of the recording apparatus, two contact breakers, polarised relay, and the necessary switches and rheostats to start and stop the machines. Cleanliness is essential. The fuse board is the distributing point of the current, and a fuse that is blown must be replaced after removing the cause, which is generally either a switchboard fault or one on the relays.

The battery is composed of eleven large chloride cells and four smaller ones. The maintenance of material, as distinguished from charging operations, is very simple, yet important, and if an erroneous judgment is made grave results may follow. The liquid must be kept at a constant level above the plates; evaporation and decomposition reduce the level, which is restored by syphoning in distilled water to the bottom of the cells. The specific gravity or density of the liquid must be kept constant. The spaces between the plates must be kept free from scale or deposits; periodical inspections, using a battery lamp, should be made to remove such deposits if any form. The voltage of each cell should be noted from day to day. If one cell gives a lower voltage than the remaining cells, it is in a weak condition, which may be due to an internal short circuit.

CHARGING AND RECORDING.

Before going on with ordinary maintenance let us consider charging and recording. The voltage of each cell is taken, also the total voltage. The charts from the recording ammeter are taken since the last charge and the total discharge can be calculated. From this the approximate number of hours can be calculated for the battery to be charged. The machine is started, the rheostats adjusted and the battery switched in, and a steady charge is maintained. As the charge nears completion the cells will gas quite freely and the specific gravity will rise. Care must be taken not to overcharge or to undercharge, but periodically it is necessary to overcharge slightly until the cells "milk." All readings must be entered and carefully checked every day. The supply meter readings should also be entered.

The main frame, intermediate distributing frame and meter rack call for little attention, as faults show up very readily. The arrester strip on the main frame gives little trouble; the blown heat coils and carbons must be replaced, after removing the cause, which is generally an outside fault.

The lamp cabinet and relays will be considered as part of the switchboard. The damaged resistance lamps, which sometimes are burnt out by an outside fault, must be replaced after the cause has been removed. The test clerk's table and chief operator's table should be treated as part of the switchboard, and the maintenance of the switchboard is again a vital point.

The great secret of successful switchboard maintenance is routine testing. Everything must be tested, the idea being to detect and remove faults, not to wait until they are reported. Starting off with the cords, supervisory circuits, subscribers' home sections or local jacks, multiple jacks, junction boards, record and telegram multiples lighting and auto-lighting circuits and finishing with instruction circuits, the whole of the most important parts of the switchboard are covered. This testing is done in the order mentioned, but of course it is clear that it cannot be done every day excepting the cords and listening keys. Special test boxes are supplied for the testing of cord circuits and multiple and answering equipment which show up any existing fault. The chief faults are broken cords, sparking and broken plugs, relays out of adjustment, sparking and noisy keys, contacts on multiples and burnt-out lamps. The faults on a central battery switchboard are not as a rule numerous, but there is a multiplicity of kinds. The test boxes give the effect of the fault, and the best thing to locate them is in many cases a simple receiver. Great care is essential in clearing a fault, especially on the switchboard itself, owing to the multiplicity of wires, and a switchboard inspector should have the circuits at his fingers' ends. Experience will tell him where to look first for a fault, but of course there is no general rule. Intermittent faults are the bane of our life; with these it seems to be a rule that as soon as an endeavour is made to clear it the fault disappears, thus preventing location. Watching and waiting for an opportune moment is the only thing to do.

The most amusing faults are those reported by the operators. These exist, or a great many do, only in the fertile and vivid imaginations of the aforesaid operators. A peculiar fault was once reported and endeavours to locate the trouble failed for some time. The complaint was that one operator received dreadful shocks, but nothing could be found to cause these shocks. After a while it was spotted. One operator was in the habit of touching the tip of a calling plug and pulling over the corresponding ringing key. The current passed through her body to the complaining operator *via* the foot rail, so that whenever the latter operator touched the sleeve of a plug she received a shock!

The switchboard is the most intricate part of all the apparatus, yet by steady routine testing it can be kept in such a state so as to give little trouble.

A POPULAR VIEW OF THE ELECTRON THEORY.

BY J. R. MILNES, *Engineer-in-Chief's Department.*

INTRODUCTION.

INVESTIGATION of late years into the theory of the nature of electricity has led to results which would seem to necessitate very considerable modifications in the attitude of the scientific world towards electricity and its relationship to matter.

It has been thought by the author, that although there is no more immediate application to telephony involved than to any other branch of electrical science, yet it might be of some interest to telephone men to keep in touch with the views which are now occupying a great deal of attention in the world of research; views which, it may be said, apart from their scientific and philosophic value exercise a great deal of fascination on the imagination.

Till comparatively recently electricity has generally been thought of as an imponderable fluid possessing the property of inertia. This view has been, shall I say, "materialised" by the very common application of the simile of water when electric phenomena are explained in the elementary text book. The result has been that this idea has thoroughly permeated the minds of many students and has often become a method of thought when considering the electric current. Now, although the water simile may still be applied for the purposes of illustration, the underlying idea of electricity as a "perfect fluid" has been abandoned.

Instead—and to sum up as briefly as possible—the net result of a long series of researches by many distinguished *savants* has been the formulation of the theory *that what we know as electricity may be considered as being a molecular property of all matter, i.e., electrical states are dependent on modifications of the atomic structure of matter.*

The philosophic interest of this may not be realised until the subject has been further dealt with, but it must be remembered, that apart from commercial application, the object of all scientific and philosophic research is to arrive at some sort of a unification of the laws of nature and to attain a homogeneous conception of matter.

Now the previous statement not only simplifies the subject by recognising electricity and matter as mutually interdependent, but enables the twin sciences of electricity and chemistry to be approached on common ground, and, as will be pointed out later, welds the already strong bonds between the two to such an extent that they may almost be thought of as a single science.

It may perhaps be said that the theory advanced by Lorentz to account for the action of light on matter first turned the eyes of science to these new departures. To make this clear to all readers necessitates a diversion for a moment to spectrum analysis. As is well known, when a ray of light is passed through a transparent substance it is bent, or what is termed refracted. Owing to the difference in wave length of the various colours one ray is bent more than the other, the difference in colour being due to difference in wave length. When a ray from a source of white light, which contains all the colours, is passed through a prism, the light is split up and spread out into the well-known colours of the spectrum as seen in the rainbow. This spectrum when thrown on a screen exhibits the phenomena of a band of light ranging from red through all the intermediate colours to blue. If now an element or substance in the gaseous state is placed between the source of light and the prism it will be noticed that there appear on the band of the spectrum a series of black lines. These lines, called the Fraunhöfer lines, after their discoverer, are always the same for the same element but vary in their location on the band of light for different elements. It is by this means, known as spectrum analysis, that minute quantities of an element can be detected in a body where other means fail. If, on the other hand, the substance is viewed by its own light in an incandescent state the lines referred to will appear as *bright* lines on a dark ground, and in this way the presence of many elements known on the earth have been detected in the sun and other stars and nebulæ.

Now Zeeman, of Leyden, discovered the remarkable, and then mysterious, fact that if the lines of certain substances were examined whilst between the poles of a powerful electro magnet a few of these lines would be found to be split up into two or three, depending on whether the magnetic field was parallel or transverse to the object viewed. (In the former case it was necessary, of course, to look at the spectrum through a hole bored in the core of the electro magnet used.)

To account for this, Lorentz assumed that the lines were due to minute *charged* particles rotating round the atom at such a speed that the periodicity of their orbit coincided with the frequency of a particular wave length of light, occasioned interference and shut it out, causing the dark line to occur at certain places in the spectrum.

By this means he was able to account for the effect observed by Zeeman by the assumption that certain of the charged particles were rotating in a right-hand, clockwise, direction and others in a left-handed direction.

Now these, being charged particles, would be affected by the magnetic field, those revolving in the one direction being slowed down or retarded and those in the other direction accelerated, thus causing the line to appear to split into two, owing to sufficiently divergent frequencies of light being interfered with to be detected in the spectroscope.

Barely a year afterwards J. J. Thomson made the significant discovery that the charge of the cathode ray particles was the same as the theoretical charge of the Lorentz particles.

A little previously Becquerel had discovered uranium radiation, and this was rapidly followed by the discovery of radium by the Curies, an element which emits charged particles (or, as they are now called, "electrons") continuously.

Shortly afterwards the mass, size and charge of the atom of negative electricity or electron were calculated by various scientists, and the scientific world was in a position to apply the new theory to account for various phenomena.

Before coming to the practical applications, however, we will proceed with the main argument and enlarge for one moment on what has previously been said with regard to the Lorentz theory. Briefly it may be taken that the atoms of all matter resemble minute planetary systems consisting of central suns around which revolve a series of electrons; of these electrons only one or two (depending most significantly on the valency of the element—*i.e.*, the proportions in which it will chemically combine with the other elements) are *detachable*, and these account for what we know as the negative static charge on an insulator and the flow of current in a conductor. Whether this central sun is in itself positive electricity, or whether certain of the undetachable electrons constitute or carry the positive charge is still a matter for conjecture.

The amplification of the theory involves the strange conclusion that apparently the constructional methods of nature in the very small are reproduced in the very great; for if an atom, say, of oxygen, were magnified to the size of the solar system, it would be to all intents and purposes very similar; Neptune corresponding to the detachable electron. In an analogous manner, if the solar system were reduced to the size of an atom, it would yield a spectrum not dissimilar to a chemical element.

(To be continued.)

NATIONAL TELEPHONE METROPOLITAN STAFF HOSPITAL COLLECTIONS.—ST. JOHN'S AMBULANCE CLASSES.

REFERRING to the preliminary announcement in last month's JOURNAL, the honorary secretary states that these classes have been so well patronised that in the case of the ladies a double class of 65 has been arranged to commence on Friday, Sept. 25, under Dr. John Forbes, and a further 23 have entered their names, but cannot be dealt with until after Christmas. These classes will be held at the offices of the Hospital Saturday Fund, Gray's Inn Road, and, in response to a unanimous request, the fund has kindly made special arrangements for these to take place on Friday evenings instead of Saturday afternoons.

Fewer entries than were anticipated have been received for the male classes, but 22 have sent in their names, and commence their first class on Wednesday, Sept. 23.

Following the lectures for first aid, a series will be arranged for both sexes in nursing and hygiene, and in both cases the fees have been considerably reduced to subscribers to the staff collections.

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CRIME BY TELEPHONE.

THE special correspondent of *The Times* in Persia, writing from Tabriz, records a picturesque instance of the adaptation of modern facilities for communication to ancient methods of brigandage. Describing his journey along the post road from Julfa, on the Russian frontier, to Tabriz, he says:

> At intervals along the post road are toll-gates, controlled by Russian employees. There are also telephone stations. The last toll-gate before Tabriz is reached is at Sophian, which is also a village of some dimensions.
>
> At Sophian the rumours which had been slowly collecting along the road were confirmed. The Russian in charge of the toll-gate had been instructed by telephone to warn all travellers that the road into Tabriz was unsafe, as the town was surrounded by wild Karadaghi horsemen, who, under the plea of conforming to Imperial orders from Teheran, were looting everyone on the road. There were at least 50 wealthy Persians collected at Sophian, who were unable to induce post-drivers to take them into the town. My own driver flatly refused, and I was forced to stay the night at Sophian. Incidentally, I received here my first tuition in Persian Imperial methods. Sophian was full of Persian soldiery, dishevelled ruffians who claimed to have come from Tabriz to protect the village of Sophian and the road, but who had really, as I subsequently learned, left Tabriz as soon as they discovered that legitimate military duties were likely to be required of them. Their officer came down to use the telephone. His men were demanding pay, and he appealed to Tabriz for instructions. These were rapidly forthcoming, and were simple enough: "Are there not sufficient travellers on the road to satisfy the demands of the small number of men you have with you?"

The telephone, we believe, is not highly developed in Persia. If it were, Persia would probably enjoy a more stable system of government and more peaceful conditions of life generally than now seem to exist in that mysterious country. Someone said years ago that the degree of civilisation of a country could be gauged by the speed of its express trains. A more up-to-date index of civilisation would certainly be telephone development, for communication reaches its very maximum of speed with the telephone. The telephone leaves the express train panting at the post, and so far out-speeds even its nearest rival as to make the electric telegraph seem as relatively slow and clumsy as the semaphore became when electricity took up the work. High telephone development then certainly means a high degree of civilisation, for rapid communication means a saving of time, and time, as EMERSON said, is the stuff that life is made of, and to safeguard and prolong life is one of the highest objects of civilisation.

Nevertheless, the telephone is sometimes used, like other products of civilisation, to further crime, to aid in attacks on property, if not on life. The Persian instance just quoted is one of the rare cases on record where the telephone has been directly enlisted as an aid to robbery with violence—robbery of a kind which might easily lead to murder. Outside of the pages of fiction, and rather clumsy fiction at that, the telephone has never been used, we believe, as a direct accessory to murder, and it would be very difficult so to use it. In fact, although both on the stage and between the covers of sensational romances the telephone has become an almost indispensable adjunct of plot and counterplot, in real life the telephone as an aid to crime rarely soars above the petty swindle, or the feeble and senseless hoax.

It is well that this should be so—that our great service, which daily and hourly, with the swiftness of the lightning, carries thought from brain to brain, should be so inherently innocent, so unadaptable to criminal purposes. The petty swindle, the robbery of an unsuspecting tradesman or householder of a few pounds, or the stupid hoax like the false fire alarm, may be effected by a false telephone message, but from the nature of the service—the very rapidity with which business is done by telephone and the personal character of telephonic communication—it is almost impossible for the telephone to be successfully used for more serious crimes than these. In the highly organised warfare that the criminal classes perpetually wage against society other modern appliances are frequently favoured by the astute criminal. The postal machinery is largely used for fraud of all kinds, few daily newspapers are free from obviously fraudulent advertisements, the train and the steamship help the unjust as well as the just—even the motor car has been used for boldly planned theft.

But the telephone is more often used to prevent and detect crime, as an aid to the enforcement of the law than as a means of defying it. A well-arranged system of telephone communication is about the most effective help the police force of a great city can have in its work of preventing and detecting crime and overtaking the criminal. The modern burglar is learning by experience to avoid the house which is "on the telephone." It has taken Scotland Yard many years to recognise the advantages of the police being available by telephone; that stolid British conservatism which keeps us a decade or two behind the times in so many things has always magnified the possible false alarm or frivolous call and ignored the value of rapid communication between public and police in time of emergency, but even Scotland Yard has seen light at last and followed the example of most provincial police forces by coming "on the telephone." Apart altogether from direct use of the telephone by the police we get daily evidence of the fact that a widely developed and highly organised telephone service is one of

the greatest aids to law and order, to peaceful pursuits, and to the preservation of life and property. The telephone is a foe to crime and only exceptionally and very rarely its friend or abettor.

THE PRODIGAL AND LACONIC CORRESPONDENT.

The article by Mr. Prentice in the July issue of the Journal on "Prodigality in Correspondence" has evoked a certain amount of controversy, and some of his strictures, levelled undoubtedly at provincial centres, have called forth some dissent. That absolute brevity is desirable in strictly inter-departmental communications (and it is to such that Mr. Prentice confines himself), and that rolling periods, professions of obligation, and assurances of assiduity are out of place in such correspondence we think there can be no two opinions; but whether this brevity should be carried to the length of crabbed English and ungraceful ellipses we are inclined to doubt. We think, moreover, if the opinion of an expert typist were taken, it would be found that he or she would find it infinitely quicker to write, for instance, "I am in receipt of your letter of 12th inst.," than by complicated manipulations of the typewriter to fill various little squares and lozenges at the top of the page with dates and symbols.

Mr. Prentice seems to suggest that brevity necessarily makes for clearness and undoubtedly a brief statement, *when clear*, is easier of comprehension than a wordy one, but it must not be forgotten that the art of saying much succinctly and in few words is by no means one of the gifts of the average writer. On the contrary it is rather a high literary attainment, achieved by studious practice. When the unpractised hand strains after brevity he probably omits some important qualification or explanation which he intended to make; and we have heard the opinion expressed, *apropos* of the article under consideration: "So long as the writer *does* say what he means I don't care how many words he uses." When one thinks of the slight saving of time effected by the omission of words—a process which may reduce a letter from a piece of English to a formula—and sets against it the time expended on re-writing letters—no doubt necessarily—on account of slight alterations occurring to the writer on re-reading them, it will seem disproportionately small.

With regard to the simple question and the indirect answer, we agree with Mr. Bates that questions are not always simple; an explanatory answer is often a more proper one than "Yes" or "No." We do not favour an Ollendorfian method of reply, such as to the question: "Have you the pens of my uncle in the district?" —"No; but I have the pencils of your aunt." But between this superfluous information and an explanatory qualification of a direct answer there is a wide gap.

THE HEROINE OF FOLSOM.

One of those noble deeds which occasionally come to remind us that actions unsurpassed on the field of battle are frequently performed in the emergencies which arise in civil life, is reported from a town in New Mexico, where Sarah Rooke, the operator of the local exchange, being warned by a telephone message of the rapid approach of a cloudburst on the town, stayed, preferring death at her post to flight and safety, to ring up and warn 40 families in the place before the overwhelming waters burst upon the exchange. Her body was found twelve miles distant, covered with the wreckage of the flood, and the telephone receiver, like the helmet of some faithful warrior who has died in harness, still fixed to her head. Whether she cherished the forlorn hope that she could achieve the noble work of warning the whole town and then effecting her escape in the nick of time before the cloudburst struck the exchange, or whether, as is much more probable, she was well aware that the fulfilment of her lofty sense of duty meant certain death is a secret which the heroic woman carried to her grave, but in the shining records of great deeds done in obscure places it will be told how that rather than flee from the impending disaster and save herself, she chose the better part and saved the lives of others.

THE EALING OLYMPIC.

Although in no way connected with telephony the dispute between the Ealing Corporation and the London United Electric Tramways Company displays some features bearing a family resemblance to past differences with corporations not unknown in the telephone world. One can well call up visions of the borough surveyor insisting, against the better knowledge of the tramway company, on the erection of standards in the middle of the road instead of on each side, and declining to allow the paving of the track with stone settes, also against advice, and declaring for soft wood. In the company's view these decisions were soon regretted and Ealing has never since ceased grumbling at the tramway system. Charges of employing top-heavy cars and an unduly light track have been brought against the tramway company, and denied. Finally, an appeal was made to the Board of Trade, who despatched Col. Yorke to inspect the track, and here a comic element quite foreign to the acts and deliberations of all government boards and corporations was imported into the affair. In the first place, Ealing, like some other corporations within the Company's experience, failed to find in the Board of Trade inspector that unquestioning sympathy with its case which it probably thought its inevitable due. Then Col. Yorke gave offence by inspecting the track from the motor car of Sir Clifton Robinson, the managing director of the tramway company. A complaint to the Board of Trade followed and thereon the third and most historic inspection took place. Col. Yorke was met by the Mayor, the Borough Surveyor and the Chairman of the Highways Committee at the boundary of Ealing and Acton—not with illuminated addresses and sound of trumps it is true, but with due civic pomp and circumstance. Col. Yorke, alas! after some brief remarks to the borough surveyor, turned what should have been a solemn procession or sacred quest into an extravaganza, a comic opera scene, and started off before anyone was ready at a pace which has since earned the inspection the appellation of the "Ealing Olympic," in more than one newspaper, and has brought the gallant colonel into favorable comparison with Dorando. The flowing-bearded borough surveyor, whose running days are over, is said to have followed gallantly; and his worship the mayor who, we are told, would not be picked out as fleet of foot, and who carried more weight than the colonel, brought up the rear. As the hopelessness of victory increased the municipal competitors gave up the race, but, by a happy thought, despatched an electric tram after the rapidly vanishing colonel, together with

an officer with a stop-watch to act as timekeeper, so that none of the requisites of a well-conducted walking race were wanting. Col. YORKE covered the first mile in fourteen minutes—a respectable pace for a man of over 60—and is described as passing the town hall "like a flash." Hotly pursued by two panting officers and the timekeeping tram, and gazing neither to right nor to left but conscientiously fixing his critical gaze on the track, Col. YORKE covered the final mile and ten yards in thirteen minutes and finished up as fresh as he started. Upon a not unnatural remonstrance from the surveyor, the colonel made a sportsmanlike offer to go over the track again, which, however, was declined, and a protest has been forwarded to the Board of Trade.

Mr. S. J. GODDARD, General Superintendent, and Mr. W. W. COOK, Assistant Engineer-in-Chief, sail for New York on the *Campania* on Oct. 17 to make an inspection of some of the telephone systems in the great cities of America and Canada, and expect to return towards the end of November.

HIC ET UBIQUE.

THE following statistics of the number of telephone stations in the principal European countries show the development of the various telephone systems as at the beginning of 1908:—

Germany	768,266
Great Britain and Ireland ...	528,763
France	178,518
Sweden	150,948
Russia	90,500
Austria	69,358
Switzerland	64,953
Denmark	60,825
Norway	49,306
Italy	44,834
Holland	43,449
Hungary	38,559
Belgium	34,200
Spain...	17,115
Portugal	4,997
Greece	1,365

Of the countries not included in the above list we give the figures for Jan. 1, 1907, taken from the *Journal Télégraphique*: Roumania, 8,005; Luxemburg, 2,527; Servia, 1,337; Bulgaria, 929; and Iceland, which appears in the list for the first time, 337 stations.

THE district manager for the Isle of Man sends us the following wayleave story:—

Some years ago I obtained a wayleave from a rather crusty old gentleman (since gathered to his fathers) to fix a bracket and some wires on the corner of his garden wall. All went well until I got an order to run a wire for the old gentleman's next-door neighbour, with whom he was on very bad terms. On hearing that his neighbour's wire was to be erected on this bracket, he wrote in a great rage ordering the bracket to be taken away at once, or he would cut the wires down. He could not be prevailed upon to let it remain, and finally a wayleave was obtained from the neighbour to put a pole in his garden close to the old gentleman's garden wall, to which pole all the wires were transferred. I heard nothing more of the matter until news came that some lads had used the pole as a means of obtaining access to the old gentleman's orchard and garden and robbing him of his prize apples and flowers, which they could not have done by means of the bracket which he made us remove. Thus he was hoist by his own petard.

SIR JOHN BLUNDELL MAPLE had a clerk in charge of his exchange wire, which, when necessary, it was his duty to switch on to Sir John's private office. One day, while chatting to a lady friend over the telephone, Sir John heard a sound which made him imagine that his clerk was eavesdropping. So he suddenly shouted, "Wilkinson, you're listening." Quite taken off his guard, the the unhappy clerk replied, "No, sir; I'm not, sir."

APPARENTLY the French operators have a telephone journal of their own in which an agitation has been going on against the employment of ladies as exchange managers. "How," they ask, "can women judge women impartially? A skirt, a blouse, a hat, a frill, or a flounce may upset, may even cause the enmity of a woman superintendent who is as dowdy as possible. The superintendent may be merely of ordinary intelligence, working with a telephone girl who is smart in intellect and smart in dress, but will she recognise her inferiority? Will she not suffer from this inferiority which she cannot bring herself to recognise? And when the time comes will she not wreak her petty vengeance on the person before whom she feels abased and mortified?"

We are not aware of this difficulty in an acute form in this country.

NATIONAL TELEPHONE CHESS CLUB (LONDON).

A CHESS club has been formed in London, and admission has been obtained to the second section of the Civil Service and Municipal Chess League, under which an attractive programme has been arranged. Matches of ten boards will be played as follows:—Engineers (General Post Office), Oct. 27; General Post Office (North), Nov. 12; Metropolitan Water Board, Nov. 24; London County Council, Jan. 5; Patent Office, Feb. 19; Local Government Board, March 2; and General Post Office (Stores), March 22. Friendly matches with the Engineers (General Post Office) and other clubs have been arranged, and the National Telephone Chess Club looks forward to a successful season. Mr. Franklin is the president, and Messrs. Anns, Clay, Goddard, Hare and Harvey Lowe are vice-presidents. The hon. secretary and treasurer is Mr. R. P. Lowe, of 17, West India Dock Road, E., to whom members of the staff desirous of joining the club should send their names. Mr. Hare, the Assistant General Superintendent, has presented the club with a board and set of men.

BURGLARS FOILED IN LANCASHIRE.

BY T. KENYON, *Inspector-in-Charge, St. Helens.*

I RELATE two instances wherein the telephone has been the chief factor in bringing to justice a gang of three dangerous men caught in the act of burgling and a much wanted man caught with a stolen bicycle. Both cases have occurred recently in St. Helens, and the prisoners are at present awaiting trial at the Assizes.

In the first case the scene of operations is the town clerk's residence, whilst Mr. Andrews is away in Switzerland on holidays. A constable, going his rounds in the early hours of the morning, discovers that an entrance has been found, and a survey inside the house is quietly made, with the result that he finds a quantity of valuables and silver goods packed ready for removal. Going stealthily upstairs he finds three burglars (well-known to the police), half drunk and half asleep in the town clerk's bed, they apparently having regaled themselves, judging from the empty bottles lying about, rather freely with the town clerk's whisky and wine. Assistance is obtained by means of the telephone from a house just across the way (the town clerk's telephone not being used in order not to molest the sleepers), the result being that within a very short space of time extra police are on the scene and what is termed a "smart capture" is made.

The second instance takes place in the shop of Mr. Chas. McLean, Duke Street, St. Helens. A rather suspicious looking individual presents a practically new bicycle for sale, at a ridiculously low price, explaining that owing to bad times and being out of work he is anxious to get a bit of money. It is noticed by McLean that the man is a stranger to the town and that the bicycle, which the stranger explains has been built for him, is of a smaller frame than a man of his stature would have, and under the pretence of consulting with his partner as to the price Mr. McLean adjourns to his private office. Being a subscriber he is speedily through to the police office and his suspicions explained, with the result that the bargain is not completed with prisoner by Mr. McLean's partner but by one of the borough detectives. The explanations given not being satisfactory inquiries are set on foot with the result that it is found that the bicycle has been stolen that selfsame day, only a few hours before, from Eccles, near Manchester, and from finger prints taken it is proved that the man is much wanted for various thefts and burglaries up and down the country.

It is very probable that had not the telephone been handy no arrest would have been made in either case.

TELEPHONE WOMEN.

XXV.—ANNIE MASTERTON.

MISS MASTERTON entered the service at Greenock early in 1888, so that she has been fully twenty years with the Company, and for the past fourteen years has occupied the position of Chief Operator. In 1888 Greenock was not a separate district but was worked from Glasgow, the local staff consisting of a local manager, one foreman and a boy, and three operators. A small upright pattern switchboard of 150 lines capacity was then in operation, having double cords with slipper plugs, the receiver and transmitter being attached to the board, and having ringing key with service cord attached. In May, 1888, the exchange was removed from its first location in Mansionhouse Lane to premises in the Municipal Buildings and a new board of the Scribner pattern fitted, consisting of two sections each of 200 lines capacity with two multiples and three operators' positions. The first section was fitted up in that year and the second section a year or two afterwards. The point which seems to have impressed itself most firmly upon Miss Masterton in connection with this new board was that it was brought into use on a Friday—the busiest day of the week—and

ANNIE MASTERTON.

when the chief operator was on holiday, leaving only two operators on duty, and she recalls clearly that there was great confusion. The next change in equipment was made in 1896 when the board presently in use in Greenock was installed. This is a canopy board, working on the call wire system, and the transfer from indicator to call wire working was quite an exciting experience—the subscribers evidently had no idea of taking their turn on the wire—and Miss Masterton's recollection of the first few days is that the state of matters was chaotic. At this time (1896) there were between 200 and 300 lines on the exchange; now there are approximately 600, the board being equipped with three multiples and twelve operators' positions (seven for call wire operators, three for measured rate, and two junctions).

It is at present anticipated that an entirely new equipment on common battery system will be installed at Greenock shortly, so that Miss Masterton will have another experience of a change of system. From what we know of common battery working, however, we feel sure that her experience on this occasion will not be of the same exciting character as when the former changes were made. Having grown up, as it were, with the system in Greenock, Miss Masterton is conversant with all the requirements of the switchroom and with the subscribers, and will be quite able to cope with any emergency which may arise.

XXVI.—GEORGINA SMITH.

MISS GEORGINA SMITH, Clerk-in-Charge of the Argyle Exchange, Glasgow, entered the Company's service in the Royal Exchange switchroom there in July, 1893. She has a vivid recollection of her first impressions of a telephone exchange switchroom, and being born and bred in the country, where telephones and the telephone habit had not then penetrated, it is little wonder that the maze of cords, plugs and jacks, and the large number of operators and the busy nature of their duties amazed her and made her have doubts as to her ability to master sufficiently the intricacies of telephone operating in the probationary period then allowed.

Within a few days of her *début* as a probationer the "call wire" system in the Royal Exchange was inaugurated and she can remember well the troubles attendant on the change of system, which was new to operators and subscribers alike.

It says much for her aptness as an operator, especially when the primitive nature of the tuition in these days is taken into consideration, that in three weeks' time she was able to operate a busy "call wire" and give a satisfactory service to the subscribers connected thereto.

After four years' good and faithful service in the Royal Exchange Miss Smith was promoted to be Chief Operator in the South Side

GEORGINA SMITH.

Exchange, the switchboard there at that time being of the hand-restoring indicator type. The operating staff comprised Miss Smith and seven operators, and they grieved when it became necessary, in one and a half years thereafter, to discard this switchboard for a new one of the flat type (worked in conjunction with the "call wire" system which was then in that exchange inaugurated) as the old one was a relic of the Glasgow International Exhibition of 1888, the "Groveries" of happy memory.

Three and a half years thereafter saw the present upright switchboard on the "ring through lamp call and clear" system installed and that system inaugurated. It was originally intended that the flat switchboard should be altered to this system of working, and it was during the process of the work to this end that fire occurred, an account of which by Miss Smith appeared in the JOURNAL for May of this year. "It's an ill wind that blaws naebody guid," and when the present upright board was installed in place of the flat one destroyed, this was a proverb not altogether absent from the operators' thoughts.

These frequent changes saw Miss Smith still on the "bridge" and it can be said unreservedly that she and her staff contributed largely to the smooth working at these times, and also during the period which elapsed between the destruction of the flat board and the installation of the upright switchboard.

In August, 1903, Miss Smith was promoted to her present position. The staff in the South Side Exchange at that time numbered nine operators, and that in the Argyle Exchange 45 operators and two supervisors, a sufficient testimonial in itself as to the opinion held by her superiors of her capabilities. The staff of the Argyle Exchange at the present time numbers, all told, 87, and of this large staff she has complete control, there being no exchange manager. That she has ably and justly controlled it and discharged efficiently the many other duties devolving on her no one can truthfully deny.

To Miss Smith, like her colleague Miss Rennie (an account of whose telephonic career has appeared in the JOURNAL), is due much credit for the good service given in the "fighting" days, and she willingly acknowledges her indebtedness to her staff in both exchanges for their active and loyal support in attaining this excellent result.

In December, 1903, an operators' dining club was formed in the Argyle Exchange premises, embracing the operating staff of the other exchanges, and after the initial arrangements were completed Miss Smith took over the active control and still continues to carry out this onerous duty with satisfaction to the staff.

In January, 1905, Miss Smith was selected as one of the teachers of the evening classes for the training of operators, and until February, 1908, when the day classes were instituted, continued to perform this additional duty with good results and in a manner meriting the approbation of her superiors. During that time she passed through her classes 266 students.

In addition to possessing a thorough knowledge of the many ramifications of "telephone traffic," Miss Smith embodies all the attributes essential for the efficient performance of the duties of her responsible position. She is a strenuous and indefatigable worker and has little time at her disposal to devote to hobbies. She, however, takes a lively interest in all matters pertaining to the welfare and social enjoyment of the staff in her own and other exchanges and departments, and for the 1908-1909 session is vice-president of the district "Operators' Society and Club."

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from page 132.)

The abuses existing at the Post Office in 1836 were many, the perquisites large, and the hours short. I have a most amusing pamphlet, *Post Office Peccadilloes*, by William Turner & Co., which throws a pretty strong light on various matters. The high cost, the varying rates of charging, and the slowness of the posts called for drastic changes; the people required better means of communication.

The man was forthcoming of just the type—Rowland Hill. He commenced a careful study of the Post Office accounts, the number of letters carried, and the cost; very ably summing up the subject in 1837 in his now celebrated pamphlet, *Post Office Reform*.

The Post Office was used by various Governments as a means of gaining information by the examination of letters. The case of M. Mazzini is historical, and at the time, 1844, a petition was presented praying for Committee of Inquiry, whose report, though secret, I have a copy of. It is interesting reading. The following is a contemporary description of the so-called secret chamber of the Post Office, where the letters were examined:—

"The door of the room was carefully bolted. At one end of the table was a large black tray, covered with an immense quantity of bread seals of all sizes. Perhaps the reader may call to mind that amongst the pursuits and amusements of his school days he diverted himself with moistening the crumb of bread and kneading it with his fingers into a consistency capable of taking and retaining an accurate impression of a seal upon a letter. The seals, or rather blank bread stamps, now upon the tray, were of this kind, only more carefully manufactured, and well consolidated with thick gum-water. Close by this tray in a large wooden bowl were wafers of all sizes and colours; and in a box, also standing on the table, were numbers of wafer stamps of every dimension used. A second box contained thin blades of steel, set fast in delicate ivory handles, and sharp as razors. A third box was filled with sticks of sealing wax of all colours, and of foreign as well as British manufacture. A small glass retort, fixed over a spirit lamp, was placed near one of the young men. A tin box, containing a little cushion covered with printers' red ink in one department, and several stamps, such as the reader may have seen used in post offices, in another division, lay open near the other articles mentioned. Lastly, an immense pile of letters, some sealed and others wafered, stood upon that end of the table at which the elderly gentleman was seated. The occupations of these five individuals may be thus described in a few words. The old gentleman took up the letters one by one, and bent them open, as it were, in such a way that he could read a portion of their contents when they were not folded in such a manner as *effectually to conceal all the writing*. He also examined the addresses, and consulted a long paper of an official character which lay upon the table at his right hand. Some of the letters he threw, after as careful a scrutiny as he could devote to them without actually breaking the seals or wafers, into a large wicker basket at his feet. From time to time, however, he passed a letter to the young man who sat nearest to him. If the letters were closed with wax an impression of the seal was immediately taken by means of the bread stamps. The young man then took the letter and held it near the large fire which burnt in the grate until the sealing-wax became so softened by the heat that the letter could be easily opened without tearing the paper. The third clerk read it aloud, while the fourth took note of its contents. It was then returned to the first young man, who resealed it by means of the impression taken of the bread stamp and with wax which precisely matched that originally used in closing the letter. When this ceremony was performed the letter was consigned to the same basket which contained those that had passed the hands of the examiner. If the letter were fastened with a wafer the second clerk made the water in the little glass retort boil by means of the spirit lamp, and when the vapour gushed forth from the tube the young man held the letter to its mouth in such a way that the steam played full upon the identical spot where the wafer was placed. The wafer thus became moistened in a slight degree, and it was only then necessary to pass one of the thin steel blades skilfully beneath the wafer in order to open the letter. The third young man then read this epistle and the fourth took notes, as in the former instance. The contents being thus ascertained the letter was easily fastened again with a very thin wafer of the same colour and size as the original, and if the job were at all clumsily done the tin box before noticed furnished the means of imprinting a red stamp upon the back of the letter in such a way that a portion of the circle fell precisely over the spot beneath which the wafer was placed. These processes were accomplished in total silence save when the contents of the letter were read, and then, so accustomed were those five individuals to hear the revelations of the most strange secrets and singular communications, that they seldom appeared surprised or amused, shocked or horrified, at anything which those letters made known to them. Their task seemed purely of a mechanical kind, indeed automata could not have shown less passion or excitement."

I may add that a similar office existed in the French Department, and was known as the *Cabinet Noir*.

Adhesive labels were employed in England in 1783 for the tax on patent medicines, etc.

In 1812 a Scotch sailing packet company is said to have issued special letter and parcel stamps, but no details are available.

In 1830 Charles Whiting proposed to the Government the use of stamped bands which he termed "Go Frees." Later, Charles Knight suggested the use of stamped covers, but nothing in reality was effected.

In 1838 Acts were passed to provide for the conveyance of mails by railways; the first travelling Post Office was put on the Grand Junction Railway between Birmingham and Liverpool, July 1, 1837.

Towards the end of 1836 the stamp duty on newspapers was reduced from *about* 3½*d.* net to 1*d.* It must not be forgotten that these stamps included the conveyance by post, and are legitimately collectable by philatelists.

In 1838 small labels or seals, somewhat similar to those we are acquainted with as used on share transfers, etc., were used to seal letters, and may have suggested the use of stamps.

Francis W. Stevens claimed to have invented the 1*d.* postage stamp, but I have no details.

Rowland Hill does not mention adhesive stamps in his first edition of *Post Office Reform*, printed in 1837, but only proposed them in his evidence before the Commissioners in February, 1837, and includes the proposal in the second edition of above, acknowledging that the suggestion was derived from Charles Knight.

In 1838 James Chalmers, of Dundee, proposed an adhesive label, as will be seen from the *Post Circular* of April 5, 1838, which I have, and which is the most interesting number of the issue, his specimen being printed: "Not exceeding half an ounce, one penny." Mr. Chalmers's first stamp is clearly the same method of prepayment as mentioned by Rowland Hill for the first time before the Committee on Feb. 13, 1837. In answer to a question Hill said: "By using a bit of paper just large enough to bear the stamp (cancelling) and covered at the back with a glutinous wash."

I must here introduce another name which may be new to some. Examined before the Committee in 1838, Cobden, as delegate for the Manchester Chamber of Commerce, said: "I have an impression that a vignette stamp about ¾ or ½-inch square to be fixed to the outside of a letter would be a very convenient plan," etc.

On Dec. 9, 1839, as an experiment, a uniform rate of 4*d.* was established for a single or ½-oz. letter; this being the first trial of charging by weight instead of by the sheets of paper used and the distance carried.

I have a letter from Bradford to Leeds, distance eight miles, dated Dec 8, the last day of the old mileage rates, and charged 8*d.*, and a letter of Dec. 9 showing the new universal 4*d.* charge.

As an example of the working on the old system two letters were prepared, one, although consisting of a piece of paper 35 inches by 23 inches, weighing just under 1 oz. if kept dry, would only be charged single rate, whereas the other letter prepared, although only 4 inches by 2½ inches and weighing only 8 grains, was charged at double rate, as a small piece of paper was enclosed. Sir H. Cole sent 50 of each to the Charing Cross Post Office by a clerk who had a sense of humour. He produced first one of the large letters. The official, after careful examination by a lamp, finding it to be single, charged it as such. Then a small letter was produced. The official turned crimson, cursed a little, but had no option but to mark it double rate. The attendant public were convulsed. Two of these letters were later produced in the House of Commons by R. Wallace.

Rowland Hill was assisted by several eminent business people, and George Moffatt's name has not been accorded the eminence it deserves. By the courtesy

of his son I am able to give your readers the following account of his share in the arduous and lengthy struggle to overcome the prejudices of officials (who, as Mr. Henniker Heaton has said, may sometimes resemble the pupil of the eye—the more light you pour into it, the more it contracts) and of a Government already hampered by want of revenue :—

"George Moffatt it was who formed the 'Mercantile Committee on Postage,' consisting of such men of influence as John Dillon, John Travers, W. H. Ashurst, the founder of the eminent firm of Messrs. Ashurst, Morris & Crisp, and Joshua Bates of Messrs. Baring Bros. He collected subscriptions, started and edited the *Post Circular*, a publication advocating a cheap and uniform Penny Postage, copies of which I should be glad to purchase.

"He commenced an agitation throughout the country, and forwarded gratuitously the ably written *Post Circular* to all Chambers of Commerce and mercantile bodies, enclosing forms of Petitions to Parliament in favour of the scheme, finding nearly the whole of the cost. Further, he assisted Cobden, and the *Corn Law League Circular* had its origin in his *Post Circular*.

"In his own words, 'I fought under the name of my Committee with my real helpmate, Mr. Henry Cole, C.B.,' and eventually he reaped the satisfactory consciousness that he had done great service to civilisation.

"George Moffatt, with characteristic modesty, relates how he bought Rowland Hill's first pamphlet, which had attracted little public attention; and of the scheme Rowland Hill told him he was of opinion that it would have to wait for years, he having failed to interest influential City people in it. Not so our Friend; he inaugurated a public meeting at the Jerusalem Coffee House at which the Mercantile Committee was formed, of which Joshua Bates was appointed Chairman, and he himself Treasurer. Mr. Travers moved, and it was carried, that 'one should be a quorum, and that one the Treasurer.' This shows us how individuality told, and Robert Wall ce being interested, Mr. Moffatt with his help succeeded in getting a Parliamentary Committee on Postage appointed. With the assistance of Mr. Cole, Mr. Moffatt put the evidence to be placed before the Committee into form; the provincial towns were placarded, and the Press posted with facts and figures. The Committee sat for two sessions, and had to be attended without intermission.

"The National Revenue was in an unsatisfactory state, and Spring Rice, the Chancellor of the Exchequer, was most unwilling to be involved in the deficit which would be inevitable by the reduction of the then average rate of 7*d*. per letter to 1*d*., so that even when the Committee recommenced this rate, Moffatt's labours were by no means ended, and the outside agitation had to be largely and indefinitely extended. Public enthusiasm increased, but subscriptions did not come in, and the Treasurer had to sustain the whole brunt of the outlay. He eventually formed a deputation of no less than 150 members who assembled on May 2, 1839, at Downing Street, to introduce the Mercantile Committee, who succeeded in influencing Spring Rice to introduce a resolution in the House in favour of Penny Postage, which however he did in a feeble and apologetic speech. The resolution was opposed by Sir Robert Peel on the grounds that 'the present financial condition of the country did not warrant the experiment.' Sir Robert Peel's resolution would have been carried but for the timely intervention of the Earl Lonsdale.

"At early dawn on July 12 1839, the division took place for 'the uniform rate of One Penny,' Ayes 184, Noes 125; and the Treasurer of the Mercantile Committee, in his own words, 'rode to his home on the Surrey hills on that bright morning while London was sleeping, the happiest man in England, in that division having found the recompense for two years' toil, sneers, sarcasms and adverse criticisms, and the more substantial disadvantages of having neglected a large business in which he had no partner.'

"The victory gained, the Treasurer sent a cheque for 100 guineas to the Solicitor, Mr. Ashurst, who magnanimously refused to increase the outlay which had been incurred. Later, Mr. Moffat had the satisfaction of obtaining the appointment of Solicitor to the Post Office for Mr. Ashurst's son.

"Writing on June 24, 1865, to Colonel Tyron, Rowland Hill said :

"'That the change which during the last 25 years has been effected in our Postal System has proved advantageous few now, I presume, have any doubt, but when the measure was first proposed, its advocates were to be found only amongst those who, earnestly desiring to advance the public welfare, were willing to share with me the risk of promoting a scheme which certainly might fail, and which some even among the liberal minded of that day considered altogether 'wild and visionary.' Among the earliest, the most reliable and most energetic friends of Penny Postage, Mr. Moffatt stands conspicuous. . . . He, till then an entire stranger to me, volunteered to undertake the formation of the "Mercantile Committee on Postage" (in the proceedings of which he took a most active part), and to raise funds for the purpose of more effectually rousing public attention to my plans, and of engaging legal and other aid in collecting evidence, and by these means bringing the facts of the case fully before the Parliamentary Committee. This, Mr. Moffatt accomplished in the most efficient manner, and I firmly believe that, but for his great exertions, the main principle of my plan—that of a low and uniform rate, which after all was adopted only by the casting vote of the Chairman—would not have been affirmed by the Parliamentary Committee. From that time to the present in all times of difficulty and trouble—and they have been many—I have invariably found Mr. Moffatt ready to set aside other engagements, however pressing, and to afford me his able, judicious and energetic assistance.

"'Believing that these facts will not be thought uninteresting or unimportant, . . . I take the liberty of troubling you with this communication and request you will make any use of it you may think proper.—I have the honour to be, Sir, your most obedient servant, ROWLAND HILL."

I have lately—by great courtesy, which I much appreciate—been given an opportunity of looking through Mr. John Dillon's albums of original letters and documents in connection with his work in the interests of Penny Postage, and feel sure the following from the originals will bring home more vividly the history and progress of the movement and the characters of the prime movers than any edited account :—

"Office of the Mercantile Committee on Postage,
"6, Freeman Court, Cornhill, 1838.

"J. DILLON, ESQ.

"REDUCTION OF POSTAGE.

"Dear Sir, Will you allow me to draw the attention of your Society, through you as their Chairman, to this very important subject, and to the great expense that must necessarily be incurred in getting up and producing evidence from all parts of the United Kingdom upon a subject so extensive and so important as this.

"The evidence already procured by our Parliamentary Agent and submitted to the Parliamentary Committee is of the most conclusive character in favour of a penny postage, but it will be obvious to you that that evidence must be confirmed from all parts of the United Kingdom, and that the mere expense of printing and of exciting general attention and sufficiently impressing its importance upon gentlemen and merchants of influence in all parts as to induce them to give their attention to getting up evidence is very great. Then, again, the rather lengthy and extensive correspondence necessary to put that evidence into a definite shape and to make a judicious selection of the witnesses to be produced of itself involves a large outlay.

"The great respectability of the firms composing your Society led me to hope that I should receive from the majority of them an amount equal to the bankers and eminent houses whose subscriptions I have advertised.

"I have not at present advertised the subscriptions you sent, because I am most anxious to include the names of many of the very respectable firms whose present subscriptions you have handed to me in the published list at a higher rate, but if I put the names of such leading houses for small subscriptions it would, as you will see, effectually restrict the future subscribers.

"This is one of the cases in which example is pretty sure to be copied, and if you think your Society cannot aid me further perhaps they will allow me to postpone the advertising of their subscriptions for the present.

"I crave your pardon, and solicit your aid in this matter, and an early communication.—I am, dear Sir, your very obedient servant,

"GEORGE MOFFATT, Treasurer.

"Bradbury & Greatorex, Aldermanbury	£2	2	0
Oliver, Watson & Dear, Aldermanbury	2	2	0
James Coster & Co., Aldermanbury	2	2	0
Cherill & Johnston, Aldermanbury	2	2	0
William Devas & Son, Lawrence Lane	2	2	0
Geo. Brettle & Co., Wood Street	2	2	0
T. & R. Morley, Wood Street	2	2	0
Llewellin, Trueman & Hitchcock, Wood Street ..	2	2	0
Rawson Cox & Co., Wood Street	2	2	0
Bowman & May, Wood Street	2	2	0
Devas, Son & Hanson, Newgate Street	2	2	0
Nalders, Spall & Co., Cheapside	2	2	0
Hadland & Shillingford, Cheapside	2	2	0
J. E. & G. Puckle, Milk Street	2	2	0
Jno. Wreford & Co., Aldermanbury	2	2	0
Wm. & Jas. Morley, Gutter Lane	2	2	0
Heeles, Gawthorp & Co., Lad Lane	1	1	0
Jno. & Wm. Smyth, Fore Street	1	1	0
	£35	14	0

"With Mr. Moffatt's compliments."

This list of the early subscribers is interesting, many of the firms are still in existence and under the same titles.

"28 Fenchurch Street, Feb. 5, 1838.

"Dear Sir,—When you send on the promised list be kind enough to hand me an introductory note to some active and popular member of your trade, who will be at the trouble of going through the different houses with me. In matters of this kind a deputation is always most efficient, and not having the pleasure of knowing any of the firms in question, I am indisposed to pass the ordeal of making their acquaintance and asking for money of parties to whom even my name is not known. I am sure you will agree with me that the large houses in the neighbourhood of Cheapside ought to subscribe readily and largely to the promotion of a measure immediately beneficial to them, and it would be a pity not to have this done effectually. If you can find me the right sort of man three hours will do it, and that time I am willing to give, but can't spare more.

"What think you of Mr. Ashurst, of the firm of Ashurst & Gainsford? Rowland Hill suggests him as a fit and proper man.

"Chas. Pearson has been asked by R. Hill, who has found him to be pre-engaged.

"Do you know any professional man more conversant with Parliamentary business and generally better qualified than the gentleman first-named?—Your very obedient servant, GEO. MOFFATT.

"J. DILLON, ESQ."

Mr. Rowland Hill certainly displayed good judgment as regards Mr. Ashurst.

"Cheapside, Feb. 10, 1838.

"POST OFFICE REFORM.

"Dear Sir,—I understand from Mr. Moffatt he will call a meeting for Monday of gentlemen feeling an interest in the reduction of postage, and in those views which have been so ably brought before the public by Mr. Rowland Hill, and that you will be one of the gentlemen whom he intends to invite.

"I take the liberty of suggesting to you, and I shall do so to Mr. Moffatt, the propriety of calling a public meeting of the merchants of London, and passing some well-considered resolutions on the subject; amongst others, one recommending that communications from all parties should be made to one common centre.

"There are so many gentlemen of high commercial importance feeling a strong interest in this matter, that it only needs a public demonstration of the

interest felt by such gentlemen as those now on the committee, to induce a powerful and influential effort.—I am, dear Sir, yours truly,

"John Dillon, Esq. W. H. ASHURST."

This letter is very businesslike and the suggestions are much to the point.

"131, Bridge Street, Saturday morning. July 21, 1838.

"J. Dillon, Esq.

"POSTAGE.

"Dear Sir,—A resolution recommending an uniform rate on all inland letters of 2*d.* and the use of the present 1*d.* posts has been carried.

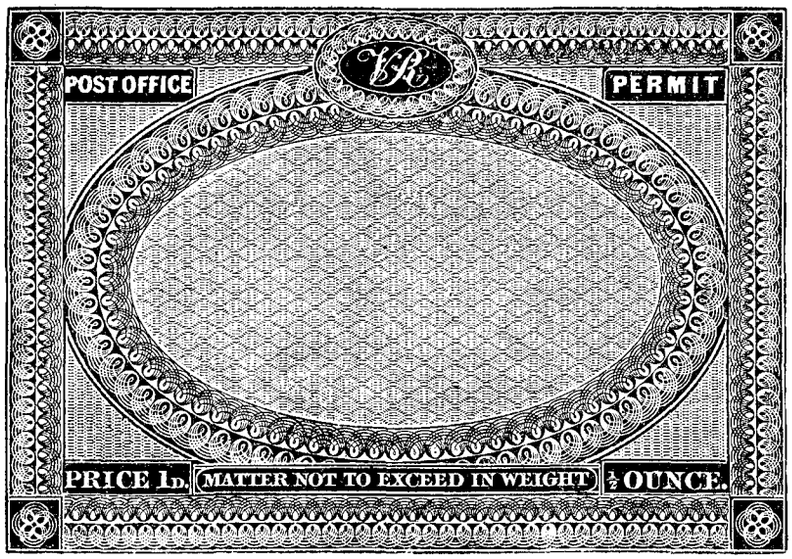
"A penny rate was first tried and lost, then 1½*d.* and lost, 2*d.* gained by Lord Lowther's note.—Yours truly, W. H. ASHURST."

This refers to the Third Report of the Select Committee on Postage, and shows us the progress made.

Now we come to the means for carrying the proposals into effect. The *Post Circular*, of April 17, 1839—

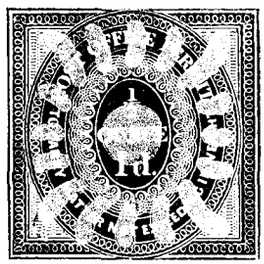
The Uniform Penny Post, recommended by the Report of the Select Committee of the House of Commons, is to be PAID IN ADVANCE; the mode as follows:—

"A stamped cover, like the specimen, or a small stamp like a medicine stamp (a dozen or quire at a time, if it please you), may be bought at any stationer's, post office, or any convenient shop, either for a PENNY, if the letter weighs only *half an ounce*, or for TWOPENCE if it weighs *one ounce*; THREEPENCE



for *one ounce and a half*; FOURPENCE for *two ounces*, and so on; one penny for each additional half-ounce. Thus, in such a cover as the specimen, which costs a penny, ANY THING whatever, not weighing half an ounce, would be carried FREE to any part of the United Kingdom.

"Some apprehensions are entertained that the vast consumption of the Post Office stamps will tempt to the forgery of them. The way to prevent forgery seems to be to create those difficulties which are only conquerable with great mechanical ingenuity and an outlay of large capital.



"THE BLUE STAMP

annexed would occasion very considerable difficulty to the forger were he to attempt to imitate it. A plate of this description having been produced, any number of facsimile plates can be made from the original plate, so that numerous impressions may be taken at one operation; the plates being so adjusted to admit of large sheets of paper being impressed at once, and those sheets cut up to the proper dimensions, in the usual manner practised by printers, would give any required number of envelopes; the original plate would at all times be preserved to make fresh plates from as those in use were worn out.—(See Mr. C. Whiting's evidence before the Parliamentary Committee.)

"*The compound plate* which is given merely as an example of a more intricate mode of printing presents still greater security. It is a specimen printed on the same principle as that used both at the Excise and Stamp Offices, and was the invention of the late Sir W. Congreve, Bart., and, as a proof of its efficiency, it may not be uninteresting to state that from eight plates the Excise Office have printed all their paper permits for nearly fourteen years without a single forgery; and probably as many as 50 millions of permits were taken from these plates. The Stamp Office has had but one set of plates in use for fourteen years, from which all the medicine stamps have been struck off used during that time, say, 140 millions, and they have had no forgery committed on them in this country.

As to speed of execution—about 1,000 impressions per hour can be well printed from *one* plate only; and one plate is capable of enduring many millions of impressions—say, 10,000,000—without any very material deterioration, if carefully adjusted in the first instance to the machine by which they are printed, and if the paper on which they are printed be not too harsh in its texture and free from grit. The machines necessary to print them are compact, and not at all complicated in their operation; for a steam engine of two horse-power four boys and two men would be sufficient to produce 100,000 stamps per diem of ten working hours, presuming there were only five plates to each of the two machines. For the smaller stamps there might be as many as 20 or 30 plates to each machine.

"As regards the difficulty of the execution of the plate, but little need be said; for there is nothing more absurd than to suppose what can be effected by one man or men is not to be accomplished by others, when the process is purely mechanical. But thus much may be fairly and confidently stated—that if any body of individuals willing to test this matter were to subscribe and direct that one or two respectable engravers should make a plate precisely similar to the specimen, so that the eye would be easily deceived, and report the expense and difficulties of the proceeding, they would be found such as to render any attempt on the part of the forger too hazardous for him to risk the almost certain chance of discovery. It may therefore be most confidently stated that any impediments to the adoption of this plan, so far as the fear of forgery is concerned, may be fully and decidedly dismissed.

"But if such a stamp be combined with any peculiar paper, also requiring the use of machinery in its manufacture (which involves an an outlay of great capital), forgery may be completely guarded against.

"A forger could not produce this stamp, on a paper expressly manufactured by order of the Government, in sufficient numbers to be profitable (were he able to secure a safe market for them) for less than an outlay of *several thousands of pounds*.

"He must first learn *how* to engrave the stamp; then possess a very complicated machine to engrave it. He must possess a costly machine to print it. He must also command a paper mill, with other very costly machinery, to make the paper. And lastly, possessing all these, he is at the mercy of not less than a dozen persons absolutely necessary for these several processes, any one of whom may inform against him.

"A merchant might send or receive an invoice or order for goods.

"A broker, tradesman, etc., a sample of any produce not weighing half an ounce—of coffee, tea, sugar, spice, indigo, flax, cotton, cloth, wheat, hops, beaver, etc.

"A young lady—a watch-ribbon, a miniature, or a locket of hair, or a shoe, pair of gloves, or a dried plant, or a piece of lace, silk, muslin, velvet, etc., of the last new pattern, a new song, etc.

"A son—a sovereign to his widowed mother to save her from an union workhouse.

"A naturalist—specimens of minerals, plants, insects, etc.

"Sir Robert Peel's last speech, or the Rev. Sydney Smith's last pamphlet, or *Nicholas Nickleby*, could be sent from Truro to Falmouth for 4*d.* if it should happen to weigh two ounces.

"The blue stamp has been prepared expressly for the *Post Circular*.

"Sermons, policies of insurance, wills, proof sheets, physic, law deeds, jewellery, a razor as a sample to Sheffield, buttons or buckles to Birmingham, a pattern of cloth to Leeds, pattern of calico to Manchester, pattern of silk to Macclesfield, a shoe to Northampton, a pattern of carpet to Kidderminster, sample of ore from Cornwall, specimen of type from Glasgow, etc., might also pass under a proper stamp.

"To save paper, you might write your letter, or print your circular, on the back of the stamp itself."

(To be continued.)

CORRESPONDENCE.

"PRACTICAL ECONOMY."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I SHOULD be glad if you could afford a little space to enable me to reply to Mr. Steriker Hare.

The suggestion regarding stores refers only to those stores which are to the staff practically unsaleable, and are booked out to "N." works orders in very small quantities. As I understand the paragraph in the Service Instructions, quoted by Mr. Hare, *re* Stores, you may book out 100 S.I. cups to "N." if the gang take out that number at once, and it is not necessary to give any details on the slips to show how many have been used on each works order; all that is required is that all the grouped works order numbers shall be quoted on the slips, and such numbers credited if any material is returned. Now, at present, if the district manager asks how many cups have been used on any works order, how is he to find out? He has to rely on the foreman's information, and he could obtain just as much accuracy with the suggested method, because the storekeeper could turn up the slips, so that the reliance on the correct bookings by the foreman remains assured.

Briefly, the method suggested is that special printed forms or dockets would be used for this stock—not necessarily duplicated or bound in book form—thus effecting a saving in two items. Foremen would hand in slips as required, and hand in returned stock exactly as they do now, the storekeeper retaining the dockets; therefore the foreman's part of the work is not altered and no slackness involved. At the beginning of each month, *i.e.*, when the stores are practically required, the storekeeper would book out the quantity authorised by the local manager or other official, the latter basing his quantities on his monthly

estimated expenditure figures for "N." works orders, so that if anything were wrong it would be with his estimate and not the stores system. But why should he over-book? Why not under-book, and book out a little towards the end of the month, as required? The fact that any adjustment is to be made does not necessitate its being done carelessly. However, these are details which would probably work out satisfactorily in practice, and it is not clear why the storekeeper should be more careless under this system than he is under the present one; if so, the fault would appear to be with the man and not the system. Further, the storekeeper would naturally provide that his bins did not run low, and thus save the suggested rushes of a morning. He would keep up his stock under this system exactly the same as he would under any other system. It is simply a matter of the forethought to be exercised by the storekeeper. The stores staff is not generally a large one, and the method would be very well known to each member.

Again, it is not agreed that a large amount of extra space is required; if a stock of, say, 1,000 cups, is kept under any system two bins of 500 should not require much more space than one of 1,000, and it would not be necessary to keep a much larger stock. Neither is the supervision by the storekeeper altered, he sees the same stock.

I do not see that at present the stores clerk has any facility for tracing errors in such a case as Mr. Hare quotes; on the contrary, it would appear easier to trace an error in five entries of 500 than 500 entries of five; further, there must be less liability of error in five entries than in 500.

It is suggested the method would be most useful in large districts, where a large number of small entries would be made for "N." works orders only. (It is not suggested to apply the system to any other allocation.) There are many cases now where special methods in other matters are advisable, and are permitted.

In this district a record was taken, and it was estimated that 2,000 entries per month would be saved, and little, if anything, sacrificed.

Brighton, September. JNO. ROBERTS.

SATISFYING PROSPECTIVE SUBSCRIBERS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

A CONTRACT may often be taken by trying to oblige prospective subscribers in small details, with results that cannot always be foreseen. This is what happened during last month at Aldershot. A man had been canvassed repeatedly, but wanted just one little thing to settle the matter. Being a great believer in advertisements I suggested that he could advertise in the local papers that he was on the telephone. Still he was undecided, on my meeting him one day he said that he would have the line on one condition only, and that was that he should be Number 222 Aldershot. This it was possible to arrange for him, so the contract was signed. One week after the enclosed advertisement was put in the *Aldershot News*. By thus obliging him we got a free advertisement and one more direct line.

THE LATEST OF
BRITTEN'S GOOD THINGS
is his Telephone Number
2 2 2
It is "altogether
TOO, TOO," TO
forget; in fact, you couldn't do so if you would.

Aldershot, September. "WAYLEAVE OFFICER."

CENTRAL BATTERY INSTRUMENTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

AFTER having read Mr. J. H. Stewart's exceedingly interesting article entitled "Some Points on Central Battery Instruments," in the September issue of the JOURNAL, I think there is one little matter which he does not lucidly explain. When considering the action of the common battery instrument induction coil, as regards *outgoing* speech, Mr. Stewart says: "The 15ω winding works as the secondary, the 30ω winding being the primary." This to me is rather curious, for if the 30ω winding acts as the primary, as stated, it means that the current has to pass from L^2 through the transmitter, receiver (30ω winding of the induction coil), and the bell coils before reaching L^1, making a total resistance of approximately 1,145ω, which you will agree with me is a little too high for a primary circuit. The inductive action upon the 15ω winding would in this case be practically *nil*. Of course I have no doubt that some small proportion of the current will traverse this path, but I should say that the major portion will follow the fundamental law and take the circuit of least resistance, *i.e.*, from L^2 through the transmitter and the 15ω winding of the coil, which in this case is possibly the primary circuit. Again, Mr. Stewart only makes a casual remark about the repeating coil transforming pulsating currents into alternating. To my mind the repeating coil (by its very name) plays the most important part of all when considering the transmission of speech. Taking, as before, the case of outgoing speech; the transmitter, 15ω winding of the induction coil, one side of the repeating coil and the battery form the primary circuit, the induced current in the other side of the repeating coil passing through the 15ω winding of the induction coil and transmitter of the distant instrument, the inductive action upon the 30ω winding and the receiver of which makes speech possible.

Bradford, Sept. 14. A. SPEIGHT, Chief Fitter.

CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IT is a pity that, with so many impediments to success, some who apparently possess all knowledge should go out of their way to discourage others.

Mr. E. J. Frazer says, "It would be interesting to know what good their average of 91·35 per cent. in 'M' Course has done students who have contrived to get an average of 88·46 per cent. in 'N' Course."

Having taken both courses (and also "D") last session, I would like to enlighten him. With schooling finished at ten and a half years of age, and no mathematics acquired until over 25, many simple things in the "M" Course were quite unknown to me, although sufficient had been learned during recent years to enable me to gain 87·2 per cent. in the "N." Undoubtedly others have taken both for similar reasons.

At the least the correspondent referred to contented himself with the "M," leaving the "N" to the time when he has sufficiently mastered the former.

ONE OF THE EIGHT.

TRAFFIC REDISTRIBUTION.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE read with much interest Mr. Coombs' article on the "Redistribution at the Bristol Exchange," and while I agree, with certain qualifications, to the main factors specified by him as constituting his bases, and that credit is due for the exhaustive and painstaking nature of his study and the valuable points thereby brought out, I feel that the importance of the work, particularly in view of its extensive nature and the consequent need for its being carefully carried out, warranted a more "scientific" method of arriving at the necessary conclusions.

In my estimation, instead of depending on the collective opinion of certain members of the staff a record of the traffic over each line at the busy hour of the day, say, for a week, should have been taken and the relative "busy-ness" of each line would *without doubt* have been ascertained. "Facts are chiels that winna ding," whereas opinion in matters of this sort is very fallible. Care should be taken that a representative week is selected for the record, and, if this is so, the figures will be as dependable as need be, and can be acted on without fear of making any serious mistake.

Such a method would have obviated any difference of opinion and the inclusion of all lines, and would have ensured that the actual calling rate of each line at the busy hour would have been taken.

Bearing in mind the increased value of a junction call, as against a local call, it might be necessary in an exchange having a large percentage of junction calls, and where the junction calls for different classes of lines varied greatly, to distinguish between local and junction calls, so that the increased value of the junction call could be allowed for as the load might be unevenly distributed if calculated on unvalued calls.

The taking of a week's record at the busy hour for a large number of flat rate lines would no doubt entail a good deal of work and interfere a little with the service, but the ultimate good result obtained would be, in my opinion, well worth the trouble. The calls, as far as "recording" services are concerned, could be obtained from the tickets made out by the operators.

I fear I cannot agree to the statement made by Mr. Coombs that the filling in of the lines not noted by the operators should not affect the evenness of the load in any way. If it has happened so it must be largely attributed to luck.

Mr. Coombs does not specially say so, although I have no doubt he means it to be understood, that the equal load refers to the busy hour of the day, and that the terms of reference to the nine members of the operating staff were in effect "What numbers do you consider the busiest at the busy hour in the exchange?"

In addition to the main factors enumerated by him, there falls to be added in large exchanges in residential districts the question of Sunday calling.

It is also advantageous to have all measured rate auxiliary lines connected on the same position as the main line, as it is not an unknown thing for a subscriber having an auxiliary or auxiliary lines to make a second or subsequent call for an engaged number over a line different from that on which he made his original application, entailing attempts by different operators to obtain the connection.

The concentration of "call offices" and other "money box" lines is not absolutely essential, there are arguments for and against it, but, as I have no experience of these lines in the larger exchanges otherwise than concentrated, I cannot express an opinion on this point.

Glasgow, Sept. 18. T. RODGER, Traffic Superintendent.

THE CLAY CHALLENGE CUP.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

I HAVE noticed from matter that has appeared in the JOURNAL that Salisbury House claim themselves to be the champions of the National Telephone Company, by winning the "Clay Challenge Cup," and from that I take it that this cup is open for competition to the whole of the Company.

If that is the case I should like to suggest that proper officials be appointed, to give everyone who cares to enter a team a chance of winning the honour.

It could easily be arranged for the entries of the south and north to be drawn together until the final tie is reached. This would, of course, be done by qualifying rounds, and then the winners of the south could meet the winners of the north for the "proper final." This would take place in the Midlands.

Let every team entering pay an entrance fee of, say, 5*s.* or 7*s.* 6*d.*, which would pay for expenses of meetings, etc.

A committee of three for the south and three for the north and one general secretary would be ample to work the cup ties, and it would also bring the various staffs in the country more in touch with one another.

If the "Clay Challenge Cup" is not available we might be able to get a "Challenge Shield" some way or another.

I should be pleased to hear from any centre that is at all interested, and we could then get the business into practical working order for the coming season.

Manchester, Sept. 18. W. KING, General Secretary,
(Telephone Employees' Athletic Association),
Manchester District.

[We are not aware that the winners of the Clay Football Challenge Cup claim to be the champions of the National Telephone Company. We think the title of the cup indicates that it is confined to London, much as the Chambers' Cricket Challenge Cup is confined to the Northern province.]

NATIONAL TELEPHONE PROGRESS.

EXCHANGES have been opened at Dringhouses (East Yorks), Rayleigh (Ipswich district), Shenstone and Barlaston (Hanley), Killaloe (Cork), West Calder (Edinburgh) and Southbourne (Hants and Dorset), making a total now working of 1,527; 1,432 new stations have been added, making a grand total of 467,117.

Great Yarmouth.—The installation of a new central battery exchange in new premises recently acquired, commences on Oct. 1.

Cambridge.—The Company's new building in Alexandra Street is now completed, and the contractors have commenced the installation of a central battery exchange there.

Reading.—The Company has installed for the *Berkshire Chronicle* a private line between a special telephone box on the Reading football ground and the offices of the newspaper in Valpy Street, for the purpose of enabling the reporter to dictate his description of the game direct to the compositor as the play proceeds. The telephones are equipped with head-gear receivers.

Morriston.—A new 200-line board has been installed and underground and aerial cable work is in progress. The ex-corporation exchange will shortly be closed and the subscribers' lines transferred to the other exchange.

Mumbles.—An extension of a 100-line switchboard is nearing completion and underground work is being carried out. The ex-corporation subscribers' lines will shortly be transferred to the new board.

Private Branch Exchange Work.—Among the larger orders secured this month are the following:—Three junctions with 22 extensions for Lewis's; six junctions and thirteen extensions for the Union Cold Stores (both Liverpool); four junctions and thirteen stations and five junctions and 47 extensions for two Glasgow firms; Mirless & Co., Stockport, two junctions and eleven stations; Monmouth County Council, three junctions, seventeen stations; and Cardiff Channel Dry Docks three junctions and thirteen stations.

STAFF GATHERINGS AND SPORTS.

Reading.—On Saturday, Sept. 12, a race between Reading and Oxford crews was rowed on the Thames at Caversham. The race was a fine struggle for half the distance, when Oxford had to slow down owing to a mishap with one of their slides, Reading winning in what was latterly a row-over for them. The accident was most unfortunate, and Oxford had general sympathy in their hard luck. A. Wheeler, wireman, stroked the Reading boat, and H. P. Nicholls, contract officer, the Oxford boat. Afterwards there was a double-sculling race, rowed in heats, for which eight crews entered, the final victors being H. P. Nicholls and F. G. Coleman, both of Oxford. Prizes of briar pipes (subscribed for by the staff in the two centres) were presented to each member of the winning crews by Mrs. Terras, and the hope was expressed that next summer an afternoon's racing on a larger scale, in which the Windsor and Maidenhead centres might join, could be arranged.

Manchester.—As was anticipated the cricket club connected with the Telephone Employees' Athletic Association won their last match of the season on Sept. 5 by the comfortable margin of seven wickets. The club have therefore secured the shield (with gold medals for the players) in the competition instituted by the Manchester and District Works Cricket League, the telephone representatives having won the premier position by seven points. Their record reads: played 12, won 10, lost 1, drawn 1; points 14. Mr. H. Hyde, of the Electrical Department, won the prize offered by the *Manchester Evening Chronicle* for the week ending Sept. 5, by taking seven wickets for five runs.

The football team commenced their season's fixtures on Sept. 5, their opponents being a team from the Manchester town hall, and the result a win for the latter by one goal to *nil*.

A social evening in connection with the association will be held in October.

Bolton.—A meeting of the district staff was held on Sept. 18 for the purpose of forming a benevolent society. Mr. A. C. Haley, District Manager, occupied the chair, and the meeting proved very enthusiastic. It was unanimously decided to form the society, and the subscription was fixed at 1*d.* per week per member. Mr. Haley kindly consented to become president; and vice-presidents, including one lady, who also act as trustees, together with an excellent working committee, were elected. Mr. J. Wilson was appointed hon. secretary, Mr. C. Fallows hon. treasurer, and Messrs. J. W. Entwistle and J. Turner hon. auditors.

Dundee.—A picnic, organised by the engineering staff, was held on Aug. 22. The party numbering about 80, and representative of all departments, drove to Fotheringham Estate, near Forfar. Tea was served shortly after arrival and during the afternoon games and races were engaged in. Splendid weather conditions prevailed and the outing was most enjoyable.

Wolverhampton.—On Saturday, Aug. 29, over 60 members of the North Midland district staff and friends, including Mr. John Scott, Assistant Provincial Superintendent, visited Milford and Brocton, near Stafford, when a most enjoyable afternoon was spent. A football match had been arranged between the inside and outside staffs, the former winning by three goals to one. Other sports, including flat races and three-legged races, were engaged in. An excellent tea was provided, which was presided over by Mr. W. S. Kay, the Chief Clerk, who expressed regret of the staff that they had not amongst them their District Manager, Mr. A. W. Smith, who was on holiday. Special reference was made to Mr. W. W. Gould, of the district office staff, for the excellent manner in which the affair had been arranged. Prizes were given for the various races, and a most enjoyable outing terminated in the rendering of songs by Messrs. R. S. Grosvenor and F. Lucas.

Leicester.—Under the auspices of the telephone society, about 40 members and friends participated in a drive to Forest Rock, about fifteen miles from Leicester. The weather fortunately was all that could be desired, and many of the members took advantage of the occasion to pay a visit to Mount St. Bernard Monastery. After a capital tea, games were indulged in, the party returning at 7.30 p.m., and reaching Leicester about ten o'clock. The arrangements, which were a great success, were carried out by Messrs. E. L. Haynes and S. V. Sansome.

Northern Province.—The final tie for the Chambers' Cricket Challenge Cup was played on Aug. 29 at Harrogate, the competing teams being Leeds (holders) and Durham. Leeds team batted first and scored a total of fifteen runs, against which the first two batsmen of the opposing side easily ran up sixteen and then retired. Durham team thus gaining a sensational win by ten wickets. J. Stones and J. Harlow for the victors had the excellent bowling averages of five wickets for seven runs and five for eight respectively; the first-named bowler also performed the hat trick. Mr. Senior, Contract Manager, Leeds, and captain of the losing team, presented the cup to Mr. Roberts, captain of the Durham team, and complimented the winners on their success. Mr. Roberts replied, and a hearty vote of thanks to the donor of the cup was carried.

Chatham.—A cricket match was played at Chatham on Aug. 29 between the local office club and a team from the Maidstone district office. An unusual result was arrived at—a tie—each team compiling 39 runs, the smallness of the scoring being due to the wet wicket. The visitors were entertained to tea before departing for the theatre, and an enjoyable time was spent.

Nottingham Factory.—The staff of the Dismantling Department, to the number of 37, had a very enjoyable outing to East Leake on Aug. 22. The winners of the sports were, 200 yards and 100 yards races, J. Gretton; three-legged race, J. Gretton and J. Cook; boot race, W. Peach; wheelbarrow race, A. Walker and A. Willis.

A cricket match was played on Saturday, Aug. 22, between an eleven of the Table Set Department and an eleven of the Switchboard Department, resulting in a win for the former by three wickets.

A second cricket match was played on Saturday, Aug. 29, between an eleven of the Table Set Department and an eleven of the General Repairs Department, resulting in a tie, 34 runs each being scored.

A third match was played on Saturday, Sept. 5, between an eleven of the Table Set Department and an eleven of the Wall Set Department, resulting in a win for the latter by two wickets.

LOCAL TELEPHONE SOCIETIES.

Greenock.—The annual general meeting of this society was held on Sept. 18, Mr. A. Ramsay Lamb, president, occupying the chair. The following office bearers were elected for the session, 1908-9:—Hon. president, Mr. F. Douglas Watson; president, Mr. A. Ramsay Lamb; vice-president, Mr. J. A. Swanson; secretary and treasurer, Mr. Geo. Archibald; committee, Mr. A. Bucklitsch, Mr. H. R. Lindsay, Mr. J. McClintock, Mr. W. McWha, Mr. C. R. Rutherglen, Mr. J. P. Ross, Mr. A. Wilson.

Liverpool and Birkenhead.—The annual general meeting of this society was held on Tuesday, Sept. 1, for the purpose of closing the work of the past session by awarding the two silver cups, presented by G. H. Robertson, Esq., to the two members of the staff who had been most successful in the Company's Correspondence Classes. It was decided to award one cup to the member of the Liverpool and Birkenhead staffs who obtained the highest percentage of marks in the "A," "B" and "M" Courses, and the other to the member of the staff in the same districts who obtained the highest percentage of marks in the "C," "D" and "N" Courses. The holders for the next year are Chief-Inspector J. Parry, who obtained 99 per cent. of the marks in "B" Course, and Inspector W. H. Kynaston, who obtained 97 7 per cent. of the marks in "N" Course. The certificates gained during the last session of the Correspondence Classes were also presented to the staff by the District Manager. The election of officers for the ensuing session was then proceeded with, and Mr. E. J. Hidden, the District Manager, was elected president. A very interesting series of papers have been promised, and a successful session is confidently looked forward to. After the general meeting of the telephone society, a preliminary meeting was held in connection with the formation of a benevolent society, and from the manner in which the proposal was received it is fully anticipated that a successful society will be launched in the Liverpool district shortly.

Cardiff Operators.—A general meeting of the members of the operators' telephone society was held on Monday, Aug. 31, to arrange a syllabus for the coming session. Mr. W. J. Marsh (Exchange Manager), vice-president, presided over a large gathering. The District Manager (Mr. Waite) was again elected president, and the following gentlemen vice-presidents:—Messrs. J. James, J. D. Duncan, W. H. Kirk, S. F. Whetton and J. Riley. Miss Edith van Riel was elected to the position of secretary, Miss E. Compton having left the service. The following ladies being elected to serve on the committee:—Misses M. Osborne, J. M. Hockey, G. M. Clargo and A. Smart. The following syllabus has been arranged:—1908: Oct. 13, competitive night; Nov. 12, paper on "Operating," by Mr. W. Napier, Engineer-in-Chief's office; Dec. 8, paper by Miss B. Williams, Supervisor; 1909: Jan. 12, Debate on several questions of operating, Miss E. Richards, Clerk-in-Charge, Barry Dock (affirmative) and

Miss M. Osborne, Senior Operator, Cardiff (negative); Feb. 9, competitive night, and March 14, paper by the Provincial Superintendent. A very interesting session is anticipated.

East Kent.—At a general meeting held in the district offices (Dover) on Thursday, Sept. 10, it was unanimously decided to continue to hold meetings during the coming session. The necessary officers were appointed. A number of papers were promised, and the District Manager (Mr. C. F. Ashby) announced his intention of awarding a prize for the best paper given during the session.

Leeds.—The hon. president for 1908-9 is Mr. J. C. Chambers; the president, Mr. W. V. Morten; chairman, Mr. W. R. Senior; secretaries, Mr. G. H. Sargeant and Mr. J. H. Corlett; committee, Miss A. Armitage. Miss E. M. Brooks, Mr. W. D. Scutt, Mr. E. J. Gillett, Mr. C. W. Halliday, Mr. P. S. Niemann and Mr. F. S. McGraw. The syllabus is as follows:—1908: Oct. 7, inaugural address, Mr. W. V. Morten; Oct. 21, "The Romance of Telephony," Mr. G. H. Sargeant; Nov. 4, discussion "Self-Help, and other Help," opened by Mr. W. R. Senior; Nov. 18, "Notes on Instructions to Foremen and Linemen," Mr. E. J. Gillett; Dec. 2, lecture, Mr. W. M. France (Head Office); Dec. 16, short studies—(1) "The Works Order," Mr. A. H. Taylor; (2) "Wayleaves," Mr. F. Fitton; (3) "Switchboards," Mr. P. S. Niemann; Dec. 30, social evening, "Telephone Society's Symposium," members only. 1909: Jan. 13, lecture, "Some Notes on Management," Mr. J. Scott (Birmingham); Jan. 20, lecture, "Notes on Engineering Construction," Mr. J. M. Shackleton (Head Office); Feb. 10, competition night, "Advance of Telephony considered under any aspect—Engineering, Electrical, Commercial, etc." Ten minutes' essays open to all members, prizes for best two; Feb. 24, lecture, "Electrical Currents," Mr. A. L. May; March 10, discussion, "Books *v.* Cards" (for books), Mr. R. B. Colclough; (for cards) Mr. A. Burdett; March 24, ladies' night—short papers on varied subjects, several ladies; March 31, annual meeting.

South Midland.—The annual meeting was held at the district office on Sept. 21, when Mr. J. N. Lowe presided over an attendance of thirteen members. The hon. secretary read the second annual report and balance sheet, which were unanimously adopted. The election of officers was then proceeded with, and the following were duly elected:—President, Mr. J. Mewburn; vice-presidents, Messrs. W. Dickinson and J. N. Lowe; hon. secretary and treasurer, Mr. W. H. Oliver; committee, Messrs. A. Booth, W. W. Stewart, E. E. Sleath, C. Sadler and F. Alcock.

Brighton.—On Sept. 9 the telephone society met and adopted the syllabus for the forthcoming session. It was resolved that prizes be given for the best papers, three of which are to be read at each meeting if time allows.

Birmingham.—At a meeting held at the district office on Sept. 18, the following officers were elected for the ensuing session:—President, Mr. Coleman; vice-presidents, Messrs. Scott and Williamson; hon. secretary, Mr. H. W. Powell; hon. treasurer, Mr. H. G. Savage; lanternists, Messrs. Dipple and Allport; committee, Messrs. Baldwin, Cornfoot, Piggott, Tucker, Allen, Gatty, Spiers, Bagley, Lloyd, Wood and Miss Williams. With such a committee of telephone enthusiasts, says our correspondent, more than usual interest is likely to be taken in the meetings arranged for, and encouraging results are anticipated, especially if the subjects suggested by a prominent member are taken up by the staff in his department, as it is expected they will be.

Exeter.—At a well-attended meeting of the staff held on Sept. 10, the proposal to form a telephone society was unanimously agreed to. The officers elected are: President, Mr. R. A. Dalzell; vice-president, Mr. H. Reid; committee, Misses C. Hatten and A. Lewis, Messrs. H. Martin, F. Michaelson, P. Humphriss and W. Sim; hon. secretary and treasurer, Mr. F. V. Squire. Meetings will be held fortnightly during the period October to March inclusive.

NEWS OF THE STAFF.

Mr. E. S. FRANCIS, Chief Electrician of the Liverpool district, has been appointed lecturer on telephony at the Liverpool Technical School for the coming session.

Mr. H. J. HERINK, Exchange Inspector, Norwich, has been promoted to Cambridge as Chief Inspector, to take charge in consequence of the introduction of central battery working there. The Norwich staff presented him with a dress suit case, as a mark of their good wishes, on the occasion of his departure.

Miss FLORENCE ROBSON, Senior Operator, Manchester Central Exchange, has resigned owing to ill-health. She was presented by the members of the operating staff before leaving with a gold locket and chain.

Mr. W. HIGSON, of the Bolton electrical staff, has been appointed teacher in telephony (City and Guilds course) at the evening classes under the Bolton education committee.

Mr. J. E. AITKEN resigned his position as Draughtsman of the northern division of Liverpool on Aug. 13 last, after about eight years' service with the Company. He is starting work on his own account as an artist. Before leaving he was presented by the staff with a handsome suit case, Mr. A. Roberts, the Local Manager, making the presentation.

Mr. W. PARRY, Night Operator, Central Exchange, has resigned owing to ill-health.

Mr. H. H. BELL, Inspector, Oxford (formerly of Colchester), has been promoted to be an Inspector at Chatham. His place at Oxford has been filled by A. LOCK.

Mr. A. WICKER, formerly of Cardiff, has been appointed a Contract Officer at Reading.

Mr. S. E. PIPE, Chief Inspector, Middlesbrough, has completed 21 years' service with the Company. He entered the service as an operator in 1887 under the Northern District Telephone Company, was transferred to the Instrument Department in 1890, and appointed Chief Inspector in 1900.

Mr. A. W. DALTON, Chief Test Clerk, Brighton, has been transferred to Dublin in a similar capacity.

Mr. H. BONHAM, Junior Inspector, Brighton, on being transferred to Chichester centre, was on Sept. 19 presented by the Brighton staff with a large handsome leather trunk.

Miss EDITH VAN RIEL, Junior Supervisor, has been transferred to the position of Senior Supervisor, Cardiff, vice E. Compton resigned.

Miss BERTHA W. WILLIAMS, Senior Operator, Cardiff, has been promoted to fill the new position of Monitor just authorised at Cardiff.

Miss M. OSBORNE, Senior Operator, Cardiff, has been promoted from Senior Operator to be Junior Supervisor, Cardiff.

The following members of the Middlesbrough staff have obtained certificates this year:—Learner L. H. SHADFORTH, 2nd class honours, City and Guilds, telephony; Inspector G. E. BURRELL, 2nd class ordinary, City and Guilds, telephony; Inspector R. ROBINSON, 2nd class, South Kensington, magnetism and electricity.

Inspector SCHNYDER (Liverpool) was on Aug. 20 presented by his colleagues with a gold albert on the occasion of his leaving the Company's service in order to take up a position in the telephone world in America. The presentation was made by the Chief Electrician, who favourably commented upon the inspector's five years' service in the Company.

Inspector B. F. KNIGHT (Chatham) was presented with a calabash pipe and pouch by the local staff on the occasion of his leaving the Company's service to take up a position in the dockyard. The presentation was made by the Local Manager, Mr. J. C. Nichols.

Miss M. CLEGG, Operator, Nelson, has been transferred to a similar position at St. Anne's-on-Sea. The staff presented her with a dressing case upon her departure.

Mr. JAS. C. MACDONALD, Cost Clerk, Blackburn, was presented with a kit bag on the occasion of his transfer to Manchester as Rentals Clerk.

Miss MARGARET KAY, Clerk-in-Charge, Tron Exchange, was, on being transferred to Charing Cross Exchange, presented with a case of silver-backed brushes, mirror and comb.

Miss POLLIE H. BONAR, Clerk, Glasgow district, has been transferred in a similar capacity to Dundee district. She was the recipient of a pendant brooch from the Glasgow office staff, together with their best wishes.

Metropolitan Traffic Staff.—*Promotions and Transfers:*

Miss L. STEVENS, Supervisor, London Wall, to be Senior Supervisor-in-Charge, Deptford.

Miss E. S. SMITH, Supervisor, Hop, to be Senior Supervisor-in-Charge, Lee Green. On leaving the Hop Exchange she was presented by the staff with a tea service.

Miss A. HILEY, Senior Supervisor-in-Charge, Deptford, to be Senior Supervisor, Battersea.

Miss C. WILLIAMS, Supervisor, Battersea, to be Supervisor, Hop.

Miss A. BUCKLAND, Supervisor, Gerrard, to be Senior Supervisor-in-Charge, Ealing.

Miss F. HARDY, Operator, Gerrard, to be Supervisor, London Wall.

Miss M. HORTON, Operator, Avenue, to be Supervisor, Hop.

Miss H. MASON, Operator, Holborn, to be Supervisor, London Wall.

Miss C. NOAKES, Operator, Hampstead, to be Supervisor, Holborn.

Miss D. OVERED, Operator, London Wall, to be Supervisor, Dalston.

Miss C. POOLE, Operator, Hop, to be Supervisor, Gerrard. On leaving Hop Exchange she was presented by the staff with a gold bracelet.

Miss L. LONDON, Operator, Holborn, to be Supervisor, Gerrard.

Miss L. WARD, Operator, Holborn, to be Supervisor, London Wall.

MARRIAGES.

Mr. R. E. BRUMBY, Assistant Chief Inspector, Hull, was presented with a clock by the members of the staff on the occasion of his marriage, Sept. 5.

Mr. C. B. THORNE, Contract Officer, Metropolitan City district was presented with a handsome marble clock on the occasion of his marriage, which took place on Sept. 1.

Miss M. WALKER, Senior Operator, Middlesbrough, resigned on Aug. 13 in view of her approaching marriage with Mr. B. O'CONNELL, who was some years ago employed by the Company at Middlesbrough and Stockton. Mr. Nicholson, Local Manager, on behalf of the staff, presented Miss Walker with a silver-backed hand mirror and travelling rug.

Mr. J. T. GALE, Rentals Clerk, Middlesbrough, was the recipient, on the occasion of his marriage, of a handsome oak and silver-mounted inkstand and a jelly dish.

Miss ELIZABETH COMPTON, Senior Supervisor, Cardiff, resigned her position in the Company's service in view of her approaching marriage. Miss Compton joined the Company's service in May, 1897, as Junior Operator; became Senior in January, 1901; Junior Supervisor in May, 1904, and was finally promoted to Senior Supervisor in January, 1905. Miss Compton has been a very reliable and faithful servant of the Company, and has filled the position she now vacates with considerable tact and ability. For the past twelve months she has acted as secretary of the operators' telephone society, the formation of which was largely due to her efforts. Before leaving Miss Compton was presented by the operating staff with an electro-plated tea service and a pair of silver-mounted salt cellars as an expression of their good wishes.

Mr. C. P. WILLS, Resident Inspector, Newbury, was presented with a clock on the occasion of his marriage, by the staff in the Reading centre.

Miss HAMPSON, Supervisor, Central Exchange, Liverpool, after fourteen years' service left to be married on July 16. She was presented by the staff with fish carvers and rest, and by her colleagues with a salad bowl and several other small presents.

Miss DEAN, Senior Operator, Central Exchange, Liverpool, left Company's service to be married on July 2. She was presented with a dinner service by the staff and with a tea service by her colleagues.

Miss FLORENCE HUTCHINSON, Senior Operator, Manchester Central Exchange, has resigned to be married, and prior to leaving was the recipient of several useful presents, including tea service, trinket set and fire screen.

Mr. S. R. LOWN, Instrument Inspector, King's Lynn, was presented with a timepiece by the local staff to commemorate his marriage on Aug. 10.

Mr. A. CARVER, District Office Clerk, was presented with a Sheraton stand and a breakfast cruet by the Norwich staff as an expression of goodwill, on the occasion of his marriage on Sept. 3.

Mr. GEORGE WM. BUTTERWORTH, Typist, Oldham, was presented with a case of cutlery with carvers by the district office staff upon the occasion of his marriage, which took place on Sept. 15.

Mr. A. BRACKLEY, Inspector at Shoreham, near Brighton, was married on Saturday, Sept. 19.

On Sept. 18 the Engineer-in-Chief, on behalf of the staff of his department and a few provincial colleagues, made a presentation to Mr. J. M. SHACKLETON, who, as announced in the JOURNAL previously, was married in June last. The present was a case of cutlery, and Mr. Gill, in handing it to Mr. Shackleton, referred to the long time he had known him and to the excellent work he had done.

The Engineer-in-Chief on Sept. 18 made a further presentation to Mr. H. C. GRAY, also on the occasion of his marriage. Mr. Gill, in handing to Mr. Gray the keys of a bureau which had been subscribed for by the staff of the department, spoke of Mr. Gray's long service at Head Office and of the good progress he had made.

Metropolitan Traffic Staff—

On July 22 at St. Mark's, Kennington, Mr. JAMES EDGHILL COLLINS, the Metropolitan Observation Officer, was married to Miss LILIAN MARTIN, who recently resigned from her position as Supervisor, Avenue. Both being very popular members of the staff they were the recipients of many valuable presents from their colleagues. The bridegroom was presented with a handsome marble clock by the traffic staff and members of the maintenance staff at London Wall and Holborn. From the Avenue operating staff, the bride received a hammered brass spirit kettle and stand; from her "team," a rose bowl and vases; from the clerk-in-charge, a table centre; from Miss Booth, a Wedgewood biscuit box; from Miss Branwhite, a case of napkin rings; from Miss J. Cooper, an embroidered cushion cover; from Miss Cowley, a pair of vases; from Miss Dennis, d'oyleys; from the Avenue cook, a set of skewers.

Other presentations to operators leaving to be married during the month were as follows:—

Miss M. HOOPER, Operator, East, bronze table lamp and a sugar bowl.

Miss A. WEST, Supervisor, Hop, china trinket set, teapot, rose bowl and scent spray.

Miss G. HIGH, Operator, Gerrard, tea service.

Miss N. FRISEDALE, Supervisor, Paddington, dinner service.

Miss G. DUNNETT, Operator, Paddington, tea service.

Miss N. NICHOLLS, Operator, Paddington, electro-plated preserve dish.

Miss E. CONQUEST, Supervisor, North, silver-plated cake basket by the staff, and salt cellars, jam spoons, cruet, etc., by the supervisors.

Miss V. SPARKES, Operator, North, silver-plated tea service.

Miss E. BALDOCK, Operator, Dalston, silver-plated cake basket.

OBITUARY.

We regret to record the death from consumption of Miss JEAN ANDREWS, late Supervisor at Holborn Exchange, who resigned from the service on account of ill-health in June last, and passed away on Aug. 29. She was much liked by her colleagues at Holborn, from whom beautiful floral tributes were sent as a last mark of respect, namely, a harp from the exchange manager, clerk-in-charge, and supervisors; and a cushion from the operators.

The very sad death also occurred on Sept. 7, in Charing Cross Hospital, of Miss VIOLET MARTIN, a half-time Operator at Paddington. She had undergone an operation for goitre, which it was thought was quite successful, but a sudden relapse occurred from which she did not recover.

The Oldham electrical staff have sustained a loss by the death of Mr. WM. ERNEST LEE, an Inspector, who has been in the service for about five years. While spending his annual holiday at Douglas he contracted a severe cold. This rapidly developed into pneumonia, from which he died on Sunday, Sept. 13, and was interred at Kirk Braddon Cemetery two days later. The staff sent a beautiful wreath in expression of their regard and sympathy. Letters of condolence have been addressed to his parents by the various departments, and and general sympathy is felt for Mr. W. Lee, chief clerk, Oldham, father of the deceased. Wm. Ernest Lee was approaching twenty years of age, was highly popular amongst the Oldham staff as a bright and cheerful comrade, and as an intelligent and painstaking official.

It is with regret that we have to record the death of Miss E. BOURNE, Senior Operator, Sheffield, on Sept. 2. The cause of her death was phthisis, which developed very rapidly. The operators subscribed for a wreath and were represented at the funeral.

BOLTON POST OFFICE.

THE staff of the Bolton section held a smoking concert on Saturday evening, Sept. 19, on the occasion of Mr. Billingham's departure for London. Mr. Roach, his successor, took the chair, and after stating the nature of the meeting, read several letters from officials of the department and the Company regretting inability to attend. Mr. Haley, the National Telephone Company's District Manager, Bolton, was present and responded heartily to the chairman's invitation to express the feelings of the National staff, several of whom were present.

The presentation of a very handsome gold chain to Mr. Billingham and gold brooch to Mrs. Billingham then took place. Mr. Billingham, in responding for himself and Mrs. Billingham, laid stress on the loyal support of the entire staff of the section which had been his, and to which he attributed a large share of their success. The evening terminated pleasantly with songs and the incense of good cigars.

ALDERMAN DR. FRANKLIN.

ON July 2 last a very interesting ceremony was performed at the Sheffield University, in which the President of the National Telephone Company was the central figure. The successful foundation of the University was greatly due to the indefatigable efforts and strenuous work of Alderman Franklin, the Pro-Chancellor, and the great debt which that city, and the work of education generally, owes to him cannot be more fitly described than in the words of Sir Charles Eliot, Vice-Chancellor of the University, who, when presenting Alderman Franklin for the degree of Doctor of Letters, which was duly conferred on him by the Chancellor, His Grace the Duke of Norfolk, said that nothing could be more appropriate than that the first degree which His Grace as Chancellor would confer that day should be given to Alderman Franklin. When the University was first constituted it was Mr. Franklin who brought the charter from London, and was welcomed by an enthusiastic band of students, and since that time it was Mr. Franklin who had watched over the best interests of the University. Somehow during a life which was crowded with financial and political occupations he had found leisure to be not only the titular head of the council, but also a guiding spirit, and to offer them most valuable advice and assistance upon many difficult questions. Everybody in Sheffield knew too well the honourable avocations of Mr. Franklin for there to be any need for him to dwell on them now. He would merely emphasise this, that during his busy life he had always made one of his interests the cause of education, especially university education. He did not know that there was any educational, literary or scientific institution which had not sometimes benefitted from his assistance, and he (the Vice-Chancellor) now presented him to His Grace as a patron and protector of letters, who was most worthy to be the first to receive from that University the degree of Doctor of Letters.

The honour bestowed on Dr. Franklin must be a source of much gratification and pride to his many friends and admirers, and the heartfelt good wishes of all readers of this JOURNAL will be with Dr. Franklin that he may be blessed with many years of health and happiness to enjoy the well-deserved honour which he has received.

"POST OFFICE ELECTRICAL ENGINEERS' JOURNAL."

No. 3 of the above will be issued on Sept. 30. Members of the staff desiring copies can obtain them from Mr. G. H. Bush, Room 31, Telephone House, Victoria Embankment, E.C.

POST OFFICE INSTITUTE OF ELECTRICAL ENGINEERS.

THE following paper, the first of a new series, is now obtainable:—

"The Manufacture of Dry-Core Cables," by R. W. Callender. Price 9*d*.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

THE benevolent society entertainments committee beg to announce that they have arranged the following events for the coming winter:—Four lectures, four whist drives, two dances, a social evening and a smoking concert.

At the social evening it is proposed to stage the best sketch or playlet written by any member of the benevolent society, for which the committee offer a prize of £1 1s. All entries must be in the hands of the hon. secretary, Mr. F. C. French, Salisbury House, London, from whom any further particulars can be obtained, on or before Nov. 21.

THE following grant was made during August:—

	£	s.	d.
Engineers' Department	5	0	0
Total number of grants to Aug. 31, 96.			
Total amount paid	273	12	3
Number of members, 2,771.			
Donation received: National Telephone Company, Limited.. ..	12	10	9

THE

National Telephone Journal

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TELEPHONE MEN.

XXX.—LIONEL HARVEY LOWE.

MR. LOWE is a Lincolnshire man, having been born at Sleaford. He was educated firstly at a private preparatory school and afterwards at Lincoln School, and subsequently attended classes in magnetism and electricity at Mason's College, Birmingham. He entered the service of the National Telephone Company in May, 1887, at Birmingham, under Mr. Coleman, who at that time was General Manager for the Midland Counties district. Telephonically it was not a very large district, but there was plenty of undeveloped territory in which Mr. Lowe assisted in inculcating the "telephone habit" now so universal. Although Birmingham was the largest exchange the number of subscribers was under 200. The switchboard then in use of the Blakey-Emmott pattern was, compared to our modern equipment, of the crudest pattern. It was not long before it was replaced by one of a multiple type and Mr. Lowe spent many evenings in assisting to fit up this board, its novelty naturally evoking much interest amongst the staff. One of Mr. Lowe's earliest duties whilst in Mr. Coleman's office was to record daily the reading of two galvanometers which were connected up to two different kinds of batteries, for the purpose of testing their relative efficiency; at that time being somewhat unacquainted with either galvanometers or batteries he was naturally much struck with the importance of this duty, and being under the impression that not only his own welfare but that of the whole telephone system depended upon these records being accurate, he spared no pains in taking the readings correctly and at the prescribed time each day, and presenting the results in an attractive form to his chief.

About the end of 1887 he was transferred to the Engineering Department, and also had opportunities for acquiring some experience of instrument work. The negotiation of wayleaves both with public and private owners fell to his lot in connection with the trunk line routes to Coventry, London, Bristol, Derby and the north. Mr. Lowe can claim a share in the pioneer work proceeding at this time, as he assisted in the establishment of exchanges at Burton-on-Trent, Derby and other places. Coventry, to open up which an unsuccessful attempt had already been made, was grappled with by him at the end of 1888, and as early as June, 1889, an exchange was opened, and communication established with Birmingham; a grand opening ceremony being performed by the mayor. Soon afterwards Mr. Lowe was appointed to assist in the management of what was then known as the Derbyshire district. At this time he gained valuable experience in line and instrument work, having often to fix instruments and clear faults, the staff in those days being necessarily limited. The district was divided in 1890, when Mr. Lowe was made under Inspector-in-Charge at Coventry, and Local Manager in 1892. On the re-organisation of the Company in 1893, by the late General Manager, Mr. Lowe was transferred to Birmingham, and three years later was appointed District Manager of the Chester and North Wales district, at that time included in the North Western province. After a year, however, the district was incorporated in the Midland province, and he was again under his old chief. Altogether Mr. Lowe spent seven years in this district, which at first contained only a few scattered single-wire exchanges, but before he left flourishing exchanges had been opened all along the coast from Connahs Quay and Conway and in various parts of Cheshire and Shropshire. Most of the exchanges were converted to the metallic circuit system and a complete underground scheme laid down at Llandudno, of which Mr. Lowe was rather proud.

Early in 1902 during the time when municipal competition was somewhat aggressive, the spirit of opposition to the Company had reached Lincoln, where, as a matter of fact, it had been decided to start a competitive system, and a large measure of support had been promised. Thither Mr. Lowe, on account of his connection with the city, was sent on a special mission by Mr. Coleman to try to prevent competition being carried out. He spent about a fortnight there interviewing all the members of the corporation and the chief citizens with the result that the matter was allowed to drop—a fact, judging from the experience of other places where competitive systems were introduced, upon which the Lincoln authorities may be congratulated.

In 1903 he was transferred to London as Manager of the Western district. The magnitude of everything which at first somewhat awed him soon became an everyday matter, and he became accustomed to think in thousands. On the reorganisation of the London staff in 1905 he was appointed Service Manager, and six months later, on the transfer of Mr. Morten to Leeds, Mr. Lowe became Chief Accountant for London. Holding this position until 1907, he then succeeded the late Mr. Bailey as Assistant Metropolitan Superintendent.

As an evidence of his interest in staff matters, it may be mentioned that he is president of the Salisbury House Football Club, a vice-president of the London Telephone Society, a trustee of the Staff Benevolent Society, and a vice-president of the Staff Chess Club. He has been a member of the Staff Transfer Association (on the Central Committee of which he has done much good work) from its commencement and was, in fact, one of its founders. He is a great believer in athletics and all outdoor sport. In his earlier days, besides winning many prizes at school sports, he has secured several valuable ones in open events at various athletic meetings in Lincolnshire and Nottinghamshire. At school he was captain of the cricket and football elevens, and since those days has taken part in many county and English cup-tie football matches. Tennis was a particular favourite summer pastime, but now the golf mania has seized him. As a hobby, photography interests him, and chess takes first place amongst his indoor pastimes.

Although five years ago Mr. Lowe was almost unknown to the London staff, he quickly won the respect not only of the chief officers of the Company (who have successfully recommended him for promotion three times in four years) but also of the whole of the staff, and has fully justified the high opinion formed of him by previous chiefs in the North-Western and Midland provinces.

"THE TELEPHONE" AND BRADFORD LOCAL PRESS.

THAT the local Press in Bradford are enthusiasts in telephone matters is shown by the fact that all the newspaper offices are supplied with private branch exchanges, and constitute striking evidence of the necessity for all large users to be on the most effective system for quick traffic. Their opinion on this point is decisive, and whilst they admit that the cost is higher at measured rate tariffs, consider the additional payment is commensurate with the facilities and benefits accruing. The *Bradford Daily Telegraph* publish a weekly list of new subscribers; and the *Bradford Daily Argus*, recognising the immense benefits to be secured from the adoption of the telephone service by traders and the necessity for publicity in connection therewith, have spontaneously opened their columns for a telephone directory, making editorial comments on the subject, which are reproduced below. The editor of the *Yorkshire Daily Observer* also is at all times willing to insert paragraphs of interest to telephone users.

"ARE YOU THERE?"

A very interesting new feature appears in the *Argus* to-day in the form of a telephone directory, in which at a glance the reader will be able to find the telephone number of a restaurant, cab hirer, wine merchant, bookseller, hatter and so forth, which he may happen to require at the moment. The immense growth of the use of the telephone of recent years suggests that it will prove an exceedingly convenient feature to the readers of the paper.

The *Argus* telephone directory will never be unwieldy. Its size will be restricted, and the best feature of all will be the alphabetical classification in trades, so that it will be possible to find what one requires at once. In the usual cumbersome telephone directories the alphabetical arrangement is one of names of tradesmen, so that a gentleman wanting to put himself into communcation with a wine merchant, for example, cannot do so unless he knows the name of one. By using the *Argus* telephone directory he will be able to discover one immediately.

Many of our largest firms do a vast share of their business by means of the telephone, and the *Argus* telephone directory will still further quicken that development and will, it is believed, be a great convenience to the readers of the paper.

TRANSFER OF CABLES FROM MAGNETO TO CENTRAL BATTERY EXCHANGE AT GERRARD.

BY G. H. GALLARD *(Assistant Engineer, Gerrard)*.

I WILL endeavour to give a brief description of the cable work at the above exchange, hoping it will interest those who have to tackle such questions as transfers from old to new premises.

In the first place, examine carefully the Head Office specifications and plans of the new exchange, with work completed by contractors, such as size of pipes, ducts, trench, etc. After consulting the Head Office official in charge of the work as to any difficulties which may occur, compile an estimate; when this is sanctioned, requisition for material and cable required, avoiding joints in new lengths as much as possible.

In the case of Gerrard Street, each cable in turn was stripped of the lead sheathing for about one yard in the basement subway at the point where new ones were to be teed on from the new apparatus room. Then each wire was tested out from the old testroom and sufficient 20/12 vulcanised indiarubber lead was inserted to whatever length was required. A leaden tubular label, with a number stamped on, corresponding to those tested out on the bars of the old testroom, was put on each lead. It was found to be cheaper to use second-hand 52-pair 20/12 vulcanised indiarubber cable (tested and insulation approved by Engineer-in-Chief) stripped of the outer covering than to use new 20/12 vulcanised indiarubber lead. Each cable was treated in this manner and the code of each was stamped on a piece of lead and soldered on at the point leading away from the subway to the mouth of the pipes.

The numbering of these leads is one of the most important parts of the transfer, as far as the Engineers' Department is concerned. If mistakes happen it is no easy matter to pick one loop out of, say, 600 or 800 loops, as occurred with some of the cables. This part of the work completed, a similar procedure had to be carried out on overhead cables at surrounding poles from the old Gerrard derrick. Whilst the work of numbering out was going on, the new cables, all of which were 600-pair lead-covered dry-core 10-lb. conductors, were run to the basement and the new derrick from the apparatus room. They were all tested with air pressure and got in position for jointing on to the silk and cotton cables, which were waxed and laced by the Construction Department.

The great feature in lacing the silk and cotton cable was the saving of time and material; the cable was so arranged that no waste should occur; a section of cable was cut long enough to allow four legs of 300 pairs each to be worked on at the same time. This was arranged by cutting the lead off the centre part of the section for a distance equal to the length of a vertical strip, plus twice the length from the lacing, where legs were fixed to the frame, to the soldered tabs, and plus twice the length from the bottom of the vertical strip to the collars fixed on the lead sheath of the cable. The collars being plumbed on to take the weight of the cable through the pipe in the floor to the trench, the silk and cotton through joints to the dry-core cable were made in the trench. This will be done in the basement. All cables were then numbered out to the basement and labelled according to the new frame numbers. Before teeing on new cables a short length of 22/12 vulcanised indiarubber was jointed on, and then teed on, number to number, as arranged, each man working to numbers given him. The method adopted in teeing on was to strip off the covering of the vulcanised indiarubber, let in old cables and tee on the end of vulcanised indiarubber from the new without breaking the working lines. Great care should be taken in testing out new cables which are on the vertical strip before teeing on; if this is not done the result will be a great number of faults. These occur in the apparatus room and are mostly caused by men working on and about the strips, therefore it is essential that a man be told off to look after them and to test with the old testroom until the transfer. In the meantime lists of subscribers, junctions, private wires and electrophone lines were got out from the cable books and sent to the Maintenance and Construction Departments to check and for

their use in cross-connecting. It was found cheaper, owing to the great number of lists, to have them got out by means of the mimeograph instead of typing them. These lists were numbered 1 to 600, which left only the subscriber's number, junction, etc., to be written in. This was a great saving in time.

After records were checked the Maintenance Department tested through from the old to the new testroom, proving all tee joints, also reversals with A's and B's, and any fault that occurred was dealt with as soon as reported; this enabled them to keep clear of queries, and I think on the whole proved satisfactory. Referring to the overhead cables, seven 600-pairs were fixed up the side of exchange to the roof, special brackets and platform being used to carry them. Here they were split into four branches of 150-pair cable, these joints being compounded, and then a through joint was made on to 150-pair aerial dry-core cables, which were run out to the surrounding poles off the derrick, which was constructed as follows:—Two main girders were strapped across by three sections of H. iron on which stood four short standards and a spliced pole in the centre acting as the distributor for open wires. These were braced together by extra stout cast-iron arms, the chairs being of a clip form to grip the pole and girders. The stays of 7/8 galvanised iron wire were made off in extra stout swivels, the other end being made fast in special rings with clips fixed on the ends of the main girders, a 50-pair pot-head being sufficient to take open wires on distributor. At the surrounding poles the 150-pair aerial dry-core cables were split into three 50-pair tails. This is called a vulcanised forked joint. The ends of 50-pair tails were ended and teed on in the same way as the underground to existing cables. After everything was tested out and changed over as described in the JOURNAL for October, 1908.

After the transfer the old tees were cut away and everything made permanent, care being taken to avoid any interruption to the service. This occupied considerable time on account of the space being very limited which only allowed three jointers to work at a time.

STATEMENT OF CABLE USED AND JOINTS MADE ON COMPLETION OF GERRARD TRANSFER.

In apparatus room—

2,100 yards 600-pair lead-covered dry-core cable, run and fixed.
250 yards 600-pair silk and cotton cable, run and laced out on 78 strips.
43 *600-pair through joints lead-covered dry-core to silk and* cotton cable.

In basement subway—

4 600-pair through joints to lead-covered dry-core cable.
2 800-pair through joints to lead-covered dry-core cable.
25 600-pair forked joints to various size cables.

On roof of new exchange—

7 600-pair forked joints to 150-pair lead-covered dry-core cable and compounded lead label on each sleeve to correspond with main frame numbers.
28 150-pair through joints lead-covered dry-core to 150-pair aerial dry-core cable with dry air plug in each joint.

On surrounding poles—

28 150-pr. forked vulcanised joints to 50-pr. aerial dry-core cable.
63 50-pair temporary vulcanised indiarubber joints.
63 50-pair permanent joints to aerial dry-core vulcanised indiarubber and pure rubber cables.

New distributing points—14 50-pair 20/10 vulcanised indiarubber cap pot-heads, coded and numbered to correspond with frame numbers in apparatus room.

Overhead distributing points—1 100-pair 20/10 vulcanised indiarubber cap pot-heads, coded and numbered to correspond with frame numbers in apparatus room.

Twenty-five thousand eight hundred loops numbered out on new cables, paper labels.

Fifteen thousand six hundred loops numbered out on old cables, leaden tubulars.

DISTRICT OFFICE ROUTINE AND ORGANISATION.*

BY T. J. CLARK (*Chief Clerk, Manchester District*).

MY paper deals with the commercial side of the Company's business, and as it would be impossible to crowd within the limits of a single paper the multitudinous details and ramifications of the clerical work, I propose to confine myself, for the most part, to the exposition of general principles.

T. J. CLARK.

As it is no uncommon experience for an essayist to be informed that the passages of quotation are the most (if not the *only*) interesting portions of his essay, I have taken the precaution to import some quotations, and, with a hope of retaining in that sense some degree of individual interest in the "picture," I have adopted the additional safeguard of quoting largely from a similar paper I read before the Liverpool Telephone Society in November, 1904.

On that occasion the meeting was presided over by Mr. Claxton, and, in his introductory remarks, there was one passage which particularly impressed me. He referred to the Engineering, Electrical, Operating and Clerical Departments as forming the four wheels of the Company's coach. Hence the futility of attaching supreme or exaggerated importance to any individual section, for, to revert to the illustration, the safety and smoothness of locomotion are dependent on each wheel fulfilling truly and well its appointed share of the burden. From this was easily deduced the importance of avoiding artificial resistance in the nature of internal friction and the essential wisdom of always seeking to promote and maintain in the highest degree the principle of smooth and efficient inter-departmental working.

The illustration may not be original, but the simile is apt and the lesson obvious.

The subject of clerical work has a wider application than may at first be supposed, for a little reflection and examination will show that a certain amount of clerical work is inseparable from the working of every department of the Company's business.

It is evident that to provide a permanent record of the work and progress of each department, certain accounts must be carefully kept of the vital transactions, and, while it is very important that no unnecessary clerical duties should be imposed upon those departments which are primarily concerned with the more technical parts of the Company's business (as, for example, the engineering and electrical staffs), yet it is in the highest degree essential that the clerical portion (whether it be great or small) shall be recorded promptly, fully and accurately.

The importance of promptly and correctly recording the work carried out, and seeing that it is done in accordance with the official instructions, will be recognised still more clearly when it is remembered that, however skilled the engineering work and however expert the electrical portion, the Company derives no direct financial benefit until the rentals and other revenue charges due to the Company have been properly scheduled, invoiced and collected, and it will be thus readily seen how largely the accuracy of these charges is dependent upon the information supplied by the departments who have carried out the actual work. Only then does the Company reap the fruit of its labours, and is able to show that return for its outlay, which is essential to success, as viewed from the practical standpoint of £ *s. d.*

* Abridged from paper read before the Manchester Telephone Society, Jan. 24, 1908.

No doubt many members of the staff who are not so famlliar with pen work, and whose active sympathies lean more in the direction of the engineering and electrical sections, regard as irksome and distasteful anything in the nature of clerical or paper work. Still, it is a duty that must be done, and no good can possibly accrue by any attempt to shirk or shelve the responsibility. Above all, let no one commit the serious mistake of allowing any sense of distaste for clerical work to drift into indifference, carelessness and inaccuracy as this will assuredly prejudice the individual's prospects, and expose the Company to the possible risk of much inconvenience, if not actual loss. Whatever our position on the staff, we can never afford to forget the old maxim—that if a thing is worth doing at all, it is worth doing well, and it is regrettable to notice how often errors with far-reaching consequences might have been avoided by the exercise of a little care and promptitude at the outset.

The Telephone Company's system of bookkeeping is a highly complex and ingenious one, and represents generally an extent and variety of accounts and statistics that is not often realised by outsiders. The most striking feature of it is that the accounts are kept in such a manner that not only are the details clearly shown, but the results are conveniently summarised on various returns, which are despatched to Head Office each month, and these returns ingeniously interlink and interbalance, so that the vital portions of the Company's operations are shown, and from the results thus furnished by each district our Head Office compiles the figures showing the Company's working and progress, necessary to complete the balance sheets and statement of accounts issued to the shareholders. I should also mention that the Company have a special audit staff, the members of which periodically visit each district for the purpose of checking the local records and verifying the accuracy of the figures incorporated in the returns submitted to Head Office.

As the monthly returns to which I have alluded possess so vital an importance, I think I cannot do better than briefly describe their nature and relation to each other, and afterwards I propose to touch upon the details of sundry clerical matters which, as in the case of works orders, may be considered as possessing a special interest.

DIAGRAM OF RETURNS.

No. 1 RETURN (CASH).

Dr. Receipts.						*Expenditure. Cr.*				
Bank balance and P.C. balance at beginning of month	No 2. rentals and fees.	No. 2A ret. Sales.	No. 2B ret. Ors. for removals.	No. 2C ret. Deposits for P.O. fees, passes, measured rate and sundry charges, including P.O. fees paid to Co.	Transfers from other centres and from H.O.	No. 4 ret. Wages	No 5 ret. Sundry payments.	No. 2C ret. P.O. fees paid to P.O., deposits absorbed and refunded.	Transfers to other centres and H.O.	Bank balance and P.C balance at end of month

FIG. 1 (A).

No. 6 RETURN (STORES AND TOOLS).

Dr. Receipts.				*Expenditure. Cr.*		
Stock bal. beginning of month.	Stores purchased thro. H.O.	Stores purchased thro. No. 5.	Transfers from other districts.	Stores issued for local use.	Stores transferred to other districts.	Stock bal. at end of month.

Wages	No. 4
Sundries ..	No. 5
Stores	No. 6

FIG. 1 (B).

ALLOCATION TOTALS AND RESULTS CARRIED TO

No. 2A return. Sales.	No. 2B ret. Removals (special charges and suspense).	No. 2C ret. Incomplete sales. Fire insurance a/c. Incomplete removals. Sale of Directories. Agreement stamps a/c.	No. 10 ret. For special H.O. estimate jobs.	Cap. ex. return No. 296.	Rev. ex. return Nos. 149 and 149A.

FIG. 1 (C).

In Fig. 1 is shown a diagram of (*a*) the cash returns, (*b*) the stores returns, and (*c*) the posting of costs to the various capital and revenue expenditure returns.

The vital financial returns are numerically known as the Nos. 1, 2, 2*a*, 2*b*, 2*c*, 3, 3*a*, 3*b*, 3*c*, 4, 5, 6 and 6*a*, and we will consider them in their numerical order.

No. 1 Return.—The particulars shown on the No. 1 return are abstracted from the petty cash return (No. 5) and from the general cash book, which latter comprises the record of our local banking transactions, and also the debits and credits received from Head Office and other districts concerning cash matters, such debits and credits being, from a bookkeeping standpoint, equivalent to cash. A debit note is an innocent looking document, which, without wasting any time in the exchange of mere compliments, gets immediately to business by announcing that a certain district will debit another specified district with a certain amount through a given month's return (say, the No. 1), the particulars of such debit being clearly stated, so that the receiving district is able to allocate the item to its proper account on the expenditure side.

In exchange for these debit notes it was formerly the custom for the receiving district to forward a corresponding credit note as confirmation of the transaction. This practice has now ceased, as Head Office decided that by so doing an economy of time and other expenses would be effected, while any discrepancy is still readily seen when the whole of the monthly returns are examined and compared at Head Office, and such discrepancies become the subject of immediate inquiry with the districts affected.

Dealing with the debit side of the return first, the starting point is naturally the cash balance at the beginning of the month, which represents the amount as per cash book (reconciled with the bank pass book) and the petty cash actually in hand as per the No. 5 return.

It may here be interesting to explain that our banking account is divided into three sections. The main or general account is known as the No. 1 account, from which certain amounts are transferred to subsidiary accounts known as No. 2 (wages) and No. 3 (wayleaves).

With regard to the No. 2 (wages) account, an estimate is made by the district of the amount required each week for wages and petty cash, and a requisition sent to the Secretary, who thereupon advises the local bank, authorising the amount to be withdrawn. The bank then transfers the amount from the general (No. 1) account to credit of the No. 2 account, and a cheque is drawn locally by the district or local manager for the exact amount thus sanctioned, so that the No. 2 account is cleared each week.

All individual payments under £2 for wayleave rentals are made locally by cheques drawn on the No. 3 account and these are duly passed through the cash book.

Against the No. 1 general account, all cheques are drawn by Head Office (as they require the signatures of a Director and the Secretary) and requisitions have, therefore, to be sent to Head Office for cheques required in payment of accounts amounting to £2 or over—payments from petty cash being limited to individual amounts under £2, excepting in a few cases where specially authorised.

These cheques are entered on the credit side of the cash book by the district concerned, and at the same time allocated to the various accounts to which the payments are chargeable.

As, however, many of these cheques may not be presented at the bank by the end of the month when we are closing the books, a special form is filled up for Head Office and attached to the No. 1 return, in which the cash book balance is reconciled with the bank balance by adding any items which may be entered as received in

the cash book, but not credited in the bank book, and on the other hand, deducting the value of cheques issued but not presented at the time of striking the balance.

All payments *received* locally are banked daily by the cashier and placed to the credit of the No. 1 general account. From the official receipt books, the cash book clerk abstracts the particulars in a "cash received" book, in which the entries are grouped under the headings of "rentals," "sales," "removals," etc., for the convenience of posting the payments to the respective registers and returns dealing with those distinctive accounts. The totals under each heading are thereupon entered in the cash book and the aggregate agreed with the amount of the cashier's paying-in slip, showing the amount banked and bearing the bank teller's initials as acknowledgment.

The aggregate receipts for the month are grouped under the heads of "rentals and fees" as per No. 2 return.

Post Office fee deposits.
Pass deposits.
Old message rate deposits.
Party line deposits.
Measured rate deposits.
Post Office fees.
Debtors for sales.
,, ,, removal charges, etc.
TELEPHONE JOURNAL account (monthly and annual).

Included also are: amounts deducted from wayleave rentals, on account of income tax; amounts deducted from salaries, on account of contributions to pension fund; and staff life assurance fund.

Rentals Paid in Advance of Due Date.—This is to provide for any payments received in advance of their being shown as due on the No. 2, 2*a* or 2*b* returns, which, therefore, it is not possible at the time to incorporate in those returns.

When the item is incorporated in the No. 2 total as paid an entry is made on the credit side of the No. 1, thus clearing or neutralising the original entry under "rentals paid in advance" on the debit side, in which position the item had really been placed as in a suspense account pending transfer to its proper position in the returns.

We now come to the debits received from Head Office and other districts.

Remembering the old bookkeeping maxim that for every debit there must be a credit, we must be careful that for every debit or credit note entered in the cash book a corresponding contra-entry is made. Thus, if Head Office debits us with a payment made on our behalf, the item is entered on the debit side of the cash book, and also entered out on the credit side to the account to which the payment is allocable.

If we make a payment on behalf of another district the item appears, of course, in our list of payments, but a subsequent entry is made in the cash book and the return affected crediting the account to which the payment was first allocated and debiting the district concerned, who then pass through their own returns a corresponding credit.

Expenditure.—Credit Side.—The principal heads are:

Wages, as per No 4 return;
Sundry expenses (No. 5 return);
Amounts refunded in respect of fee deposits and pass deposits;
Payments to Post Office for Post Office fees incurred by Company's subscribers;
And the amount of deposits and party line deposits absorbed by calls during the current month, as per No. 2 return.

With regard to "rentals paid in advance of due date," this provides, as already explained, for the adjustment of entries made on the debit side in a previous month's No. 1, which are now shown as due and paid in the returns affected.

Having completed our record of expenditure, we show the balance of our No. 1 and No. 3 accounts and the petty cash balance, as per No. 5. This enables us to account for all the items debited under the head of "receipts" and to agree the grand totals on both sides.

No. 2 Return and Summary.—Rentals.—This relates to the very vital matter of revenue, and records the particulars of all rentals brought forward as outstanding from the previous month and those due in the current month. It also records the current month's payments, the amounts written off and the amounts carried forward as arrears to next month.

The sum of the last three columns therefore balances the sum of the first two columns.

The rental accounts involve a large amount of clerical work and great care in handling, as so many points need to be watched. We have many positive rules to guide us, but the real difficulty is in learning to catalogue the exceptions.

Accounts for new rentals are rendered at date of completion from the completed works order and rental register, and in the case of renewals the accounts are rendered in advance of the due date.

It is worthy of mention that the present form of rental register is cut for the different days of the month so as to allow for the entries of all rentals falling due on the same day of the month to be grouped together, and thus to facilitate greatly the despatch of accounts, notices, etc. In addition it is a great convenience in summarising for return purposes the allocation of rentals under the various due dates.

No. 2a Return.—Sales Account.—This relates to transactions for sales of stores and installations sold outright. Sales of scrap material are, however, excluded from this return and entered on the No. 2*b* instead.

No. 2b Return.—Removal and Sundry Charges.—This includes all accounts for removals, sales of old materials, and sundry charges which do not fall within the category of rentals and sales proper.

No. 2c Return.—This relates to the amounts received and repaid or absorbed in connection with Post Office fee deposits, pass deposits, message rate deposits, party line deposits, measured rate deposits, also a statement of the amounts outstanding in respect of Post Office fees.

Provision is made on this return for recording the sale of directories and the amounts outstanding for agreement stamp account, and also for balancing, with the works order cost slips, the expenditure in connection with incomplete works orders for sales, removals and fire insurance account.

No. 3 Return.—New Subscribers.—This represents the particulars of all new lines added and the return is written up daily from the completed "N." works orders. It also includes service lines and any additions or alterations in the mileage owing to removals, cable installations, etc.

No. 3a Return.—Ceased Subscribers.—This records all necessary particulars in regard to lines ceased and is written up daily from the "C." works orders.

No. 3b Return.—Summary of 3 and 3a.—This is a summary of the 3 and 3*a* returns, and tabulates under the heads of stations, lines, revenue, mileage and instruments, the new, ceased and net results for the month.

The stations, lines and revenue are further subdivided and analysed under the heads of unlimited rate, message rate, measured rate, party line, "A to B" and private, with a "sundries" column for any exceptional cases which elude classification under any of the standard headings.

No. 3c Return.—Analysis of Measured Rate Connections.—This is a return recently introduced and is designed to show in summary form the particulars of stations, lines and revenue, under each head or division of the measured rate service.

The entries on the No. 3 return are checked with the rental register each month to ensure that the new revenue shown in the former has been duly charged through the latter. This is another instance as to the manner in which one return dovetails with another.

No. 4 Return.—Wages Statement.—This is a return in which we all have a very direct and personal interest and does not therefore need much in the way of explanation. The time or equivalent wages value of each member of the staff has to be allocated under certain heads of expenditure according to the work engaged on, and all alterations of staff have to be proposed, sanctioned and finally passed through certain special returns. A separate staff card is kept for each individual, and this card records the length of service and alterations of salary from time to time, etc. An arrangement is

adopted in this district by which the staff cards are periodically brought under the notice of the management, so that by the end of each year every staff card has been independently reviewed. The allocation of salaries is done in the wages analysis book and the staff time sheets are carefully examined to extract the amounts allocable to the various works orders, and which are afterwards posted to the individual cost slips for the works orders concerned.

The subject of time sheets is a very important one. Briefly, it may be said that the time sheets should give sufficient detail to clearly show the work actually done and the works orders to which the time is allocable.

The information should be sufficiently complete that if a question is subsequently raised in regard to time booked to any works order the foreman or inspector will have no difficulty in rendering an intelligible account of the work done and why the recorded time was so allocated.

No. 5 Return.—Sundry Payments.—This is in effect the petty cash book and contains the payments made from petty cash and also the items transferred from the general cash book and here allocated to their respective accounts. The difference between the "received" and "paid" columns represents, of course, the petty cash balance, which at the end of the month is carried to the No. 1 return. The balance of the weekly wages cheque, after deducting the amount actually expended on wages, as per No 4 return, is entered on the "received" side of the No. 5.

The No. 5 is made up and sent to Head Office weekly together with the accompanying vouchers for audit purposes. With the return for the last week of the month a summary is given showing the grand total for the month.

(*To be continued.*)

A PEEP INTO AN EASTERN SWITCHROOM.

By LILIAN DAKERS (*Clerk-in-Charge, Alexandria Exchange, formerly Clerk-in-Charge, Bolton*).

As an ex-member of the staff of the National Telephone Company, of my connection with which I am exceedingly proud, it may possibly be interesting to my compatriots and co-workers at home if I endeavour in a simple way to draw a picture of the surrounding conditions of the operating of an Oriental switch-room.

LILIAN DAKERS.

It must be borne in mind that the population of Alexandria consists of some 600,000 inhabitants, representing people from various countries of both hemispheres, and the city is therefore one of the most cosmopolitan in the world. In passing through its streets for the first time, a few months ago, I was amazed at its motley crowds in their strange and picturesque dress, and skins of ebony black, brown and yellow. Meeting these people at close quarters gives to one born and bred in Lancashire rather a strange sensation; but use is second nature, and it passes!

The hours of labour are not set to any particular time, and business continues from Monday to Sunday without any perceptible break. It is a common occurrence in the early morning, between 1 a.m. and 3 a.m. to hear people passing to their homes through the semi-light of an Egyptian night, singing to their heart's content.

They are returning from their favourite cafés, which are found at stated places along the sea and in every street in the town. There they sit, smoke and take refreshment and meet their friends. There is an almost continuous service of electric cars.

At 5 a.m. the daily toil begins afresh and continues to noon, at which time the heat is very trying, but there is always a cool breeze and the cheap carriages are a saving grace. Then to those who can afford it follows the siesta of a few hours, and, remarkable to relate, even the Arabs of the peasant class afford it!

If they are inclined to cry "*Maalech*" ("Never mind") to other business they are ever ready to share in this part of the programme! Their favourite resting-place is the pavement of the public street, where they slumber peacefully for hours. To many of them I am afraid the ground is their only resting-place, but they are an exceedingly contented race in spite of their hard lot, and seem quite happy with a stone for their pillow.

Almost every citizen is conversant with three or four languages, but the Arab only knows his own, consequently foreigners are compelled to honour him, as he will not oblige them. The Arab has come to the fore in the demand for the telephone with amusing and disastrous results to the service, for he cannot help but introduce the ancient Egyptian element, as I will explain later. Italians have settled here in great numbers, but French is the official language used.

In the foregoing remarks I have made an effort to give an idea as to the character of the 3,000 subscribers. Now I will ask you if you will please take your place with me for a few minutes behind the chair of an operator and consider her trials. The female staff are composed of the daughters of many countries, and include Egyptians, French, Germans, Italians, Maltese, Spanish, Roumanian, and Corfuan. It is compulsory that they speak three languages fluently, viz., French, Italian, Arabic, and they must be acquainted with English numbers.

To an Alexandrian operator the familiar greeting of "Number, please," used by an English operator would be impossible. Therefore the second best direct expression used by them to French, Italian and English is "Central."

This expression is easily understood by speakers of these languages, and the number is at once given. If, however, the caller happened to be our friend the Arab, he would not grasp the word at all, but would immediately ring, thinking there was a fault on the line! Therefore the special expression for him is "*Compagnia.*"

After the completion of the call you would be pained to witness a storm of ring-off indicators. It is quite a hopeless task for an operator to attempt to teach him that it is wrong to ring, as she will do what is necessary. Remonstrance is like water on a duck's back, and on he will go as though he were turning a barrel organ; and again, if the operator asks him not to ring he will say "*Naum,*" which in Arabic means "What."

As an equivalent of the English expression of "Number engaged," the substitutes in the different languages are as follows:—

	Italian	. . ...	"*Numero occupato.*"
	French	... ...	"*Numero occupé.*"
	Arabic	... ...	"*Masfadi.*"

For "No reply":—

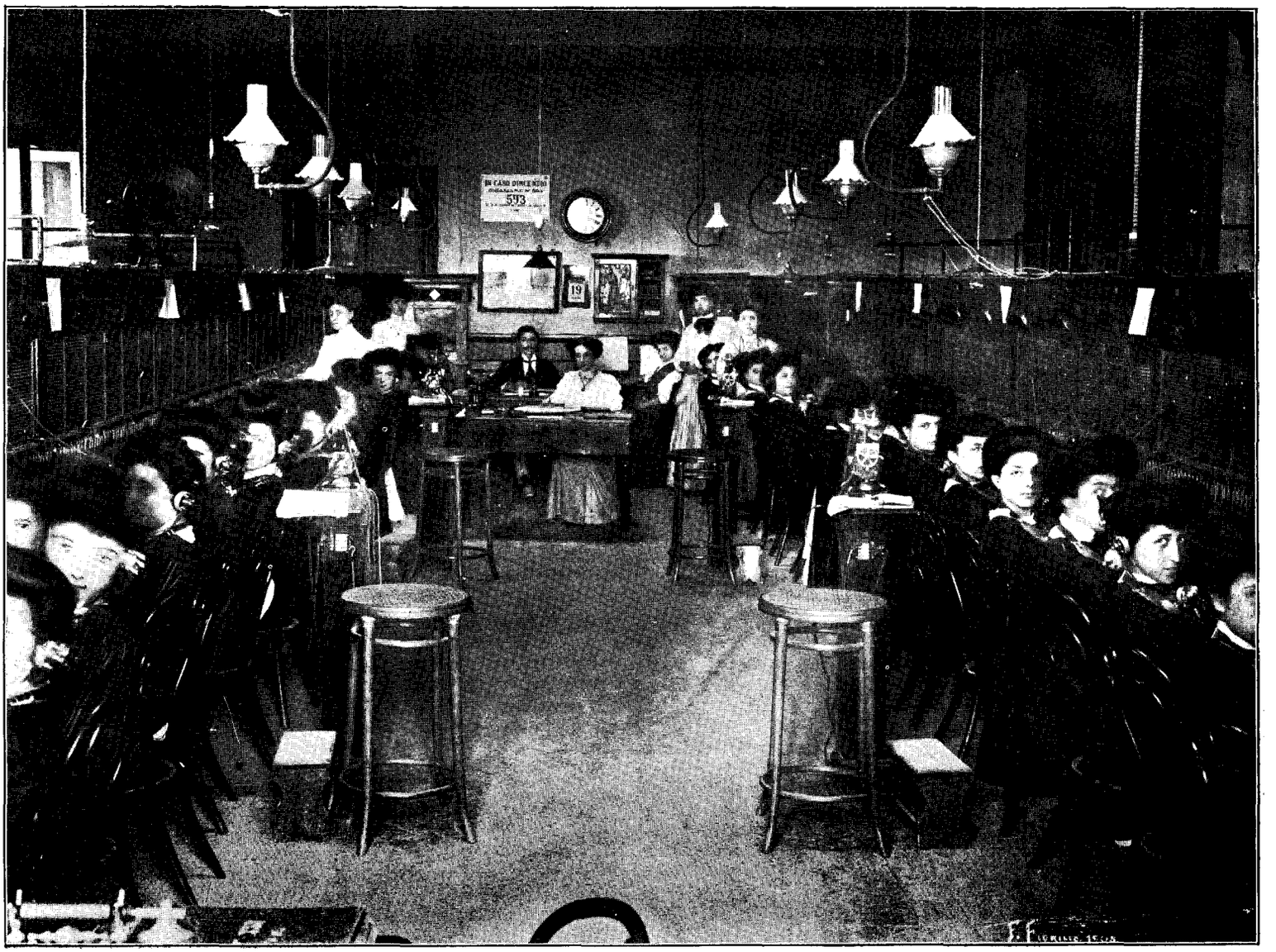
	Italian	... ...	"*Non responde.*"
	French	... ...	"*Pas de response.*"
	Arabic	... ...	"*Maberodish.*"

Frequently the Arab cannot quite grasp the expression and he will repeat "*Adene-el-sica,*" the literal meaning of which is "Give me the street." Then again the operator will gently inform him—"*Maberodish.*"

The crowning difficulty is his utter ignorance of the importance of listening when he has given the number. Immediately after doing so he bangs down the receiver on the hook, and the operator is filled with anxiety. It is frequently the responding ring of the called subscriber which bids him return to the ill-used telephone.

Under these circumstances it is really fortunate that the unlimited rate is the only service in use here. I tremble to think of the measured rate service in the hands of the Arabs! In England and elsewhere it has been adopted with marvellous success, yet I should be very interested if any of my readers could vouch for similar results in a place where nearly all races congregate.

We have the magneto indicator system, constructed by the Western Electric Company. There is a peculiarity in the arrangement of the switchboard numbers which seems very strange.



ALEXANDRIA SWITCHROOM (EGYPT).

Nought is the first number, then follow one, two, etc. The strips are in twenties, but in consequence of making use of No. "Zero," as it is called in French, No. 100 terminates on 101 "jack," according to our English system. The Ericsson system is used at our sub-exchange of Ramleh, with the same singularity. It seems so useless to begin the switchboard numbers with "Zero," as it thus throws the twenties on irregular lines.

I am exceedingly pleased to state that the girls are very willing and intelligent, and most polite to the subscribers. During the months passed here no reports have come under my notice of incivility on the part of an operator, and civility is a very important asset.

The operators' duties are dependent upon the business of the town, and run from Monday to Sunday with a break of half a day.

In conclusion I wish to express deep pleasure for the transmission of the *National Telephone Journal* to Egypt. Only people away from home can fully realise its value. It is delightful to peruse its pages and, though so far away, to be in touch with officials and operators for whom I have every regard. I trust it will never lose its way or its power to attract.

FOREIGN INTELLIGENCE.

Germany.—German newspapers report that Herr Kraetke, the Secretary of State, has in no wise altered his intention of replacing the flat rate by a measured rate tariff. It is stated that only considerations of a just balance between the charges paid and the service rendered have influenced the Post Office in proposing a rate reform. Therefore it is not in accordance with facts to connect the telephone tariff reform in any way with the financial reforms. The financial reforms will be considered by the Reichstag in the autumn, while the introduction of the new telephone rates cannot be thought of until the beginning of 1910. The Secretary of State is not disinclined to fulfil some of the requirements voiced in commercial and industrial circles, but no alteration of the principle of the measured rate is to be expected.

Hungary.—From the official statistics of the Hungarian Posts, Telegraphs and Telephones for 1907, we learn that there were then 32,764 telephone stations as against 28,912 in the previous year, 1,153 exchanges as against 1,045. The total number of local calls was 118,751,925 as against 102,915,958, and of trunk calls 1.324,641 as against 1,107,152.

AUXILIARY CALL OFFICE SIGNS.

BY O. W. STEVENS, *District Manager, Norwich.*

IN very large towns call offices are usually so numerous that there is no difficulty in locating them, in the business centre at any rate, but in smaller towns and in the suburbs it is not such an easy matter. Even when a sign is correctly fixed to the front or side of premises used as a call office, it is frequently not conspicuous enough; is in competition with other hanging signs, or may be obscured by sun blinds. Again, by reason of the character of the building or on account of objection raised by the proprietor of the building, signs cannot be fixed in ideal positions, and small ones perhaps have to be substituted for the standard size.

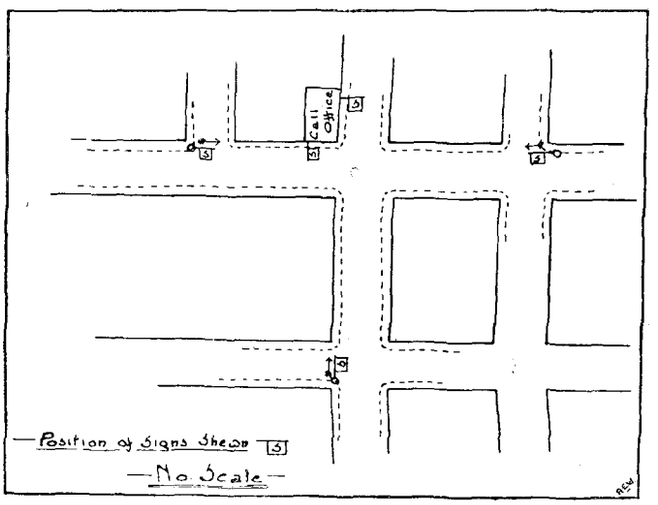


FIG. 1.

The effective area covered by a sign attached to a call office is very small, and the sign does no more than attract the attention of the actual passer by; therefore, the question arises how this area can be increased so that people passing in adjacent streets can be informed of the vicinity of a call office, and how the various drawbacks that are sometimes attached to the position occupied by a call office sign can be overcome.

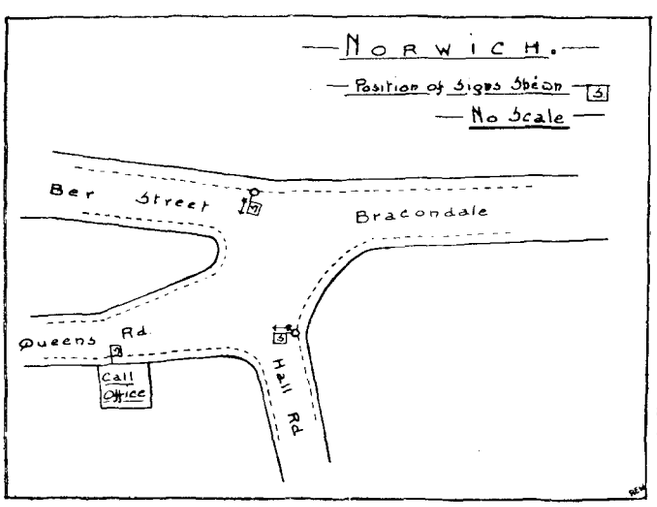


FIG. 2.

The ideal situation for a call office sign is one isolated from all other signs and advertising matter, at a proper height above the pavement, so that it cannot escape observation. Such positions can be secured by attaching signs to lamp posts, trolley poles, sewer ventilating shafts, and in one instance a light ornamental iron extension to a corporation hydrant secured a sign at a point where it was especially required.

For this class of work signs with a pointing hand are essential, the hand being either on the sign itself; or a second enamelled sign, consisting of a large hand only, can be fixed to the bracket above the ordinary sign, than which it is found to be more conspicuous, showing as it does more clearly at a distance the direction in which the call office is to be found. The usual practice in this district is to determine the most favourable positions for these auxiliary signs, each case demanding special treatment, and then fix three or four signs to the most convenient trolley poles, gas, or electric light standards in streets adjacent to the call office, particular attention being given to street corners. Figs. 1, 2 and 3 show diagrammatically the method employed in different cases, the signs being shown projecting over the roadway for convenience and clearness. This naturally is not possible; they must hang clear of all traffic over the footpath. It will be noticed on examining these diagrams that the effective area of a call office from a public point of view can be very largely extended by the employment of auxiliary signs, and within reasonable limits this area may be increased by increasing the number of signs, if local circumstances permit.

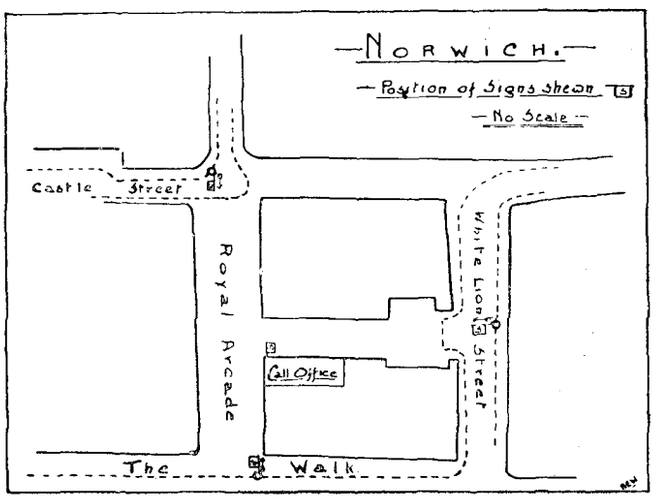


FIG. 3.

FIG. 4.

That the public will avail itself of a facility is well known, and the easier it is to find a call office the larger will be the number of calls made, altogether apart from the suggestion which a well positioned sign must throw out to all who see it. It must not be overlooked that among the many advantages of an attachment to street lamps is the illumination of the sign during the winter months and at night. It is a question whether it would not be advisable

to have a special pattern sign for this work, the standard pattern is too square for the ordinary lamp posts, although it is suitable for larger columns. An oblong shape would be entirely suitable for all purposes, it might be lettered "Public Telephone Call Office," an arrow underneath indicating the direction. Distance such as 50, 100 and 150 yards might be added. In this district the corporations, tram companies, electric light and gas companies have given their consent to the principle of fixing call office signs to their lamp posts, standards, etc., although stipulations as to size and height from ground have in some few cases been insisted upon. In applying for such facilities, the convenience to the public has been represented, as most corporations will not allow anything in the nature of an advertisement to be attached to their property. Figs. 4 and 5 represent actual signs fixed in Norwich. Fig. 4 shows auxiliary signs fixed to trolley poles adjacent to a call office. Fig. 5 is the one attached to a hydrant before mentioned, the fixing of which brought a protest from the adjoining residents, who

FIG. 5.

complained that the "Blue Bell" was like a public-house sign, and a petition to the corporation was threatened unless the company removed it forthwith. It was explained that there could be no similarity between a public-house sign and the Company's standard call office sign, more particularly as the latter was attached to a "hydrant." The difficulty was overcome by substituting a different pattern sign.

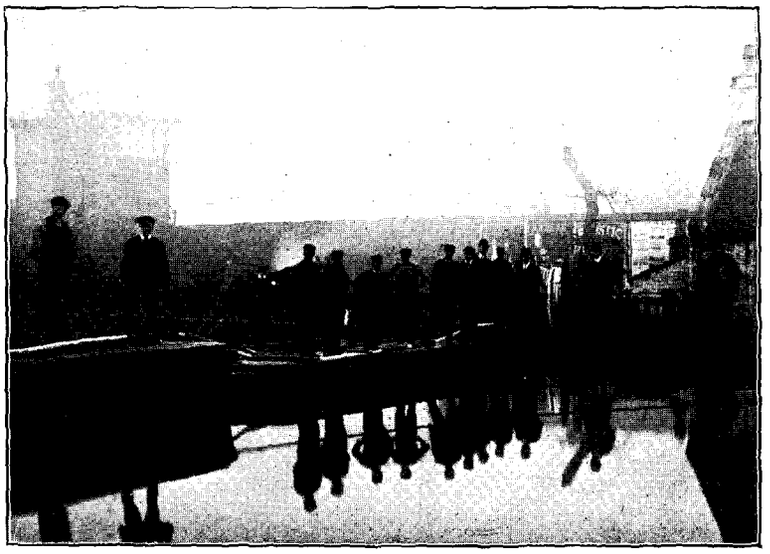
There can be very little question that these auxiliary signs increase the business of any call office, if they are judiciously placed and are a boon both to the stranger and occasional telephone user, in addition to inviting recruits from that section of the public which does not use the telephone.

LAYING SUBMARINE CABLE AT CLYDEBANK.

BY FOREMAN T. BURN, *Glasgow.*

IN order to cope with the rapid development of the district to the north of Clydebank, called Radnor Park, the Company some time ago substituted 150-pair for the existing 52-pair armoured cable crossing the canal at Kilbowie Road Bridge. Some notes I made while the work was in progress may interest the readers of the JOURNAL.

The work of trenching the canal and laying the cable was carried out by the Company's men, with the assistance of a canal banksman and under the supervision of the canal engineer. All the dredging apparatus was borrowed from the canal company. The barges were moored right across the waterway and we proceeded to cut the trench, using for this purpose a spoon dredge (a large shovel with an extra long handle) worked from the centre of the canal, and hauled by means of a large winch to the bank. On the sides at the centre of the shovel there is a chain bridle, with an iron ring, to which is attached the hauling rope from the bank. The winch, I may mention, had to be securely anchored to withstand the heavy strain. When all was in readiness, the man on the barge took the dredge to the centre of the canal and held it at the proper angle, while the men at the winch heaved and brought it ashore, the mud which it had hauled up being deposited on a scow convenient for the purpose. While dredging operations were going on we were very much hampered by passing boats, this part of the canal being very busy. Every time a boat came in sight we had to let go our moorings, and had to be very careful when making fast again to see that we were in the right spot. To this end marks were put on our mooring ropes. After dredging one-half of the canal for two days, we shifted our position and dredged the other half. The material fished up made a very miscellaneous collection; visions of sunken treasure ships came to mind, only instead of bullion, we found soup and bouillon tins, hoop iron and the like.



After we had got the depth, of from 2 feet to 3 feet, required by the engineer, we got the cable in readiness for running. We chose the slackest time (ebb tide), knowing that we should not be disturbed for an hour or two. The cable was run off the drum, right across the canal on the barges, pieces of 3-inch iron pipe being slipped on it and wedged firmly, and then at a given signal we all lowered together. The accompanying photograph shows the cable about to be lowered.

When the canal engineer was satisfied that the cable was right down in the trench, we started to fill in. About twelve tons of clay, specially got for the purpose, was thrown in and beat firmly about the cable, also some of the best of the material which we had trawled up.

When all the wires had been transferred from the old to the new cable, we set to work to recover the old one. It looked as if "All the king's horses and all the king's men" would not drag it from its watery position, so firmly was it embedded in the bottom of the canal. With the aid of the canal company's steam breaker, however, we lifted it out. Most of the men employed had had some experience as seamen, and during the operations nautical terms were freely used.

So ended an experience which does not occur every day in the life of a telephone man.

A POPULAR VIEW OF THE ELECTRON THEORY.

BY J. R. MILNES, *Engineer-in-Chief's Department.*

(*Continued from page* 147.)

II.—DATA REGARDING THE ELECTRON.

BEFORE proceeding to the application of the electron theory to ordinary electrical phenomena it will be as well to give some general data as regards the electron itself, and the following particulars are of interest:—

To quote from Fournier d' Albe's *Electron Theory:*

> "The mass of an electron or particle of negative electricity is approximately $0{\cdot}61 \times 10^{-27}$ grammes. Its radius about 10^{-13} centimetres."

The average speed of the electron in its orbital path in the atom is about 900 miles per second, and it completes 2,200 billion complete revolutions in one second.

> "One electron placed at a distance of 1 centimetre from another electron will repel it with a force of about 1 quadrillionth of a pound. This force may appear excessively small, but, as a matter of fact, it is enormous, being more than a trillion trillion times greater than gravitational attraction which accounts for the weight of bodies on the earth's surface and the motion of the heavenly bodies. How enormous it is may be realised by the following imaginary experiment. If two masses of lead each weighing one gramme be placed 1 centimetre apart they will attract one another with a force of $6{\cdot}6 \times 10^{-8}$ dynes, a force quite too small to be measured by any known instrument. But if 2 grammes of pure negative electricity (electrons) be placed at the same distance they will repel one another with a force of 320 quadrillion tons."

If removed to the distance of the poles of the earth they will still repel each another with a force of 192,000,000 tons, and that in spite of the fact that the force decreases as the square of the distance. This force would be capable of imparting to each of these grammes of pure electricity a velocity equal to that of light (186,000 miles per second) in less than the millionth of a second, and would only fail to do so owing to the fact that the inertia of each electron becomes infinite, or nearly so, as it approaches the velocity of light. Fournier d' Albe adds: In any case it is obvious that the experiment must remain purely imaginary! He continues, that to reduce the acceleration to manageable proportions it is necessary to assume the force exacted by a gramme of electrons on the earth acting on all the free electrons in the sun. Even at that enormous distance ($1{\cdot}53 \times 10^{13}$ centimetres) it would suffice to impart to them a velocity equal to that of light in twenty seconds.

It is evident from the above considerations that in all ordinary electrical phenomena we are dealing with a very minute quantity of free electricity.

To gain some idea of the amount of free electricity we have to deal with we can take the case of two suspended charged copper balls (radii 1 millimetre) repelling one another to a distance of 1 centimetre. The number of free electrons causing this displacement can be proved to be 1,260 million. Now, although this appears high, it can be calculated that the possible number of detachable electrons in the balls is about 10,300 trillion. The ratio of the charge (1,260 million electrons) to the possible free electrons therefore becomes

$$\frac{\text{10300 trillion}}{\text{12600 million}} = 8 \text{ billions.}$$

Thus the necessary force of repulsion is due to one extra electron in 8 *billions.*

It is found practically impossible to remove more than 1 billionth of the detachable electrons, thus explaining why the charging of a body produces no perceptible difference in its weight.

If, however, as in the cathode in a vacuum tube, or the positive carbons in an arc lamp, electrons or positive atoms are continually discharged from a body the body is gradually disintegrated.

From the foregoing remarks we have seen that the atom* hitherto thought of as the smallest possible body, and considered indestructible, in reality probably consists of a central positive body around which revolve a series of exceedingly minute bodies, possessed of enormous energy, in orbits (of a size relatively quite comparable with those of the planets of the solar system), and called electrons or particles of negative electricity.

The electrons vary in their arrangement and speed in the different elements, and these variations probably account for the dissimilar chemical and other properties of the elements. Of the large number of electrons connected with each atom one or more only constitute the detachable charge, but, except in certain molecular and chemical actions, for all practical purposes sufficient forces cannot be brought to bear on them to remove more than 1 billionth of even the actually detachable electrons, and this small proportion is responsible for the phenomena we recognise in connection with electricity.

The removal of the negative electron of course leaves the atom, as we say, positively charged.

We can now proceed to a brief examination of the various electrical phenomena in the light of these views.

In the manifestations which are generally included under the heading of static electricity the electron plays an exceedingly interesting part in simplifying our conception of what takes place when a body is charged, and relates the static and current effects in a way more definitely than has hitherto been possible.

To quote the time-honoured experiment. If a glass rod is rubbed with a piece of dry silk it will be found to have acquired a positive charge. This positive charge appears to be due to the friction having caused the transfer of a certain number of electrons from the glass atoms to the silk, leaving the number of detachable electrons in the glass rod in an abnormal minority, and causing a stress to be set up in the ether when a body containing any free electrons approaches the charged body.

This stress would appear to originate, not from the positively charged body itself but from those aggregations of small atomic systems where the electrons are normal or in excess of the number habitually required to produce equilibrium. The free electrons in a conductor immediately hasten to attach themselves to the charged body when it is touched by or brought into very close proximity with the conductor, whilst the bound detachable electrons in an insulator appear to be displaced on their orbits with a drag towards the positively charged body. The orbits become flattened and elliptical, and the action of the polarised light shows that a molecular stress is occurring in a body subjected to the above conditions.

It will be seen later that this stress condition is only occurrent in bodies we call insulators, the difference between an insulator and a conductor being due to the relative difficulty with which an insulator will part with its detachable electrons compared to a conductor.

It will be noticed that all conductors are more dense and generally have a higher valency than insulators; in a good conductor it may be taken that there is always a rapid interchange of detachable electrons progressing whether current is flowing or not, the fact that no current is observed being due to the summation of the forces set up producing equilibrium as a whole.

A good conductor then must be such that, the atoms being close packed, there is a possibility of the free change of electrons amongst the atoms.

The electrons in fact are the carriers of what we call electric current, and without their presence, as for instance in a perfect vacuum,* no electricity can flow.

In an insulator, despite the presence of electrons, the current does not flow to any appreciable extent on account of the structure and comparatively low density of the substance preventing the interchange of these carriers. Thus, in a proper definition of a good conductor we must observe two conditions: (*a*) the presence of carriers or electrons; (*b*) the ease of their transfer from one atom to another.

Although the reason for the inability to displace an electron in an insulator is not clear, it is notable that a good conductor has

One cubic centimetre of copper contains about 1 quadrillion atoms.

* It is well to note that a perfect vacuum under certain conditions may become ionised or permeated with electrons. Under these circumstances it becomes a perfect conductor, *without* the electrons a perfect insulator.

a low specific heat—that is to say, a small amount of heat increases the molecular velocity, causing rapid movement, and probably aids in the transfer of electrons.

Fournier d'Albe states that in copper it has been roughly estimated that every electron combines with an atom and is again liberated about 100,000,000 times per second. "For every 5,000 seconds which it spends locked in the embrace of an atom it roams free for one second. It is these roaming atoms that produce all the phenomena of conductivity."

From J. J. Thomson's estimate of the charge of the electron ($3{\cdot}4 \times 10^{-10}$ electrostatic units) it can be calculated that 2,930 million electrons are equivalent to one electrostatic unit. This has been called by Fournier d'Albe one "company" of electrons, and he has restated the laws of repulsion as follows:—

(*a*) One company of electrons repels another company placed at 1 centimetre from it with a force of 1 dyne.

(*b*) One company of neutral atoms deprived of one electron each repel another such company at 1 centimetre with a force of 1 dyne.

(*c*) One company of electrons attracts a company of neutral atoms deprived of one electron each with the force of 1 dyne.

(*d*) These forces vary inversely as the square of the distance (the distance being large as compared with that between the individual electrons or atoms).

(*To be continued.*)

RESIDENCE DEVELOPMENT ADVERTISING.

BY F. ALBANY, *Contract Manager, Portsmouth and Isle of Wight district.*

THE question of advertising is perhaps one of the most difficult problems that we are confronted with in dealing with the question of residence development—difficult because all preconceived ideas of the ordinary forms of business advertising are rudely shattered, for I think it is conceded that it is a fatal mistake to apply the same method of advertising both to business and private residences—the private resident requires special and careful treatment at every step during the process of his conversion. The usual form of circularising with printed pamphlets, etc., is in my opinion next to valueless; the number of expensively got up pamphlets advertising the measured rates, supplied from time to time by Head Office, would no doubt produce splendid results if they were read and if we could ensure them reaching the proper person, but can we be in any way certain of this? Is it not most likely that they will go the way of all circulars sent to private houses? We have only to fall back on our own every-day experience to prove this. How many of the numberless advertising circulars left at our own doors are ever even opened? Unless it is something quite out of the ordinary their destination is the fire; any mistress of a house will tell you that she looks upon the ordinary advertising matter constantly showered upon her as an unmitigated nuisance. I may be told that *all* forms of advertising become a nuisance, and that it is a case of "Constant dropping will wear away the stone," but I think that our aim should be to devise some method whereby the stone will be worn away a little quicker, and it is with this object in view that I venture to recommend to your notice the system in vogue in Portsmouth.

It is obvious that the ultimate object to be achieved is to get your advertisement—whatever its form—into the hands of the right person; unless you do this you had better keep your money in your pocket. This object will, I maintain, not be achieved by the ordinary method of circularising—by "ordinary" I mean the scattering broadcast of matter in such large quantities that before it can be followed up by a canvasser its effect has been lost by reason of the length of time that has elapsed. In order to derive the fullest value from your advertisement a canvasser should follow up within a week at least. It follows, therefore, that the first thing to be observed is to send out your material in such quantities as will enable you to follow it up quickly.

The most effective form of advertisement for private residences is in my opinion the mimeographed letter, which should be short and to the point, and—I place great importance on this point—signed personally by the contract manager or on his behalf. If the signature is mimeographed the whole effect is lost; it is the fact that the letter is signed by hand that at once arrests attention and disarms suspicion. I have come to the conclusion that this is the *only* form of advertisement that in a vast number of cases stands any chance of falling into the right hands. If you have accomplished this you have passed the first toll gate on the road to success; the next thing to accomplish is to get your advertisement read. If it is a printed pamphlet the chances are that it will be thrown into the fire, but if it is apparently a typewritten communication, signed in ink, who is going to throw that away unread? You have now achieved your object—your advertisement has reached the proper person and it has been read—its mission is accomplished. The next step is a visit in a few days from a canvasser who calls with reference to a letter sent from the Company. It is important to note that the canvasser should associate his call as closely as possible with the letter and still endeavour to maintain the personal nature of the transaction; disabuse your man of the impression that he has merely received an ordinary advertisement puff, let him think that he (or she) has received a special letter from the Company which calls for attention. I may here say that it is no uncommon thing for replies to be received "referring to your letter of yesterday," etc., which goes to prove to my mind that the communication has not been looked upon as an advertisement.

A point I particularly desire to emphasise is the importance of having the envelopes addressed in correct form, giving proper titles, etc. In fact nothing should be left undone to give the communication the semblance of an ordinary business letter, and last but by no means least, it should bear a penny stamp. A letter bearing a halfpenny stamp means one of two things: a bill or an advertisement; and neither is welcome.

It is obvious that in order to carry out this system properly and in order to get the smallest percentage of letters returned marked "Not known," "Gone away," "House empty," etc., your mailing list must be reliable and up to date. It is not much good relying on the directory unless you correct it from time to time, making additions, alterations, etc., and this is impracticable for many reasons.

The method adopted in Portsmouth is as follows:—Commencing with roads with houses of an annual rental of, say, £25, "Unsuccessfull interview" cards are written out for every house in the road; the card is made out showing the number and road on the top line and the name on the second line. These are then arranged in strict numerical order; if any house has a connection the card is marked in red ink, "Subscriber," and left in the drawer in its proper position; this will prevent the sending of letters to existing subscribers, which is most inportant, as great harm can be done by sending to, say, a flat rate subscriber, a letter singing the praises of a cheaper service. These cards will constitute a permanent mailing list; they are brought up to date by the canvassers and the names are altered, removals noted, and they show if the house is empty, etc., etc.

Another point, avoid house to house canvassing as you would the plague. Nothing is so demoralising to the canvasser. Give him three or four roads to work and arrange his calls so as to avoid calling from door to door after the style of the insurance and sewing machine canvasser.

A very effective form of advertisement introduced by myself in Portsmouth is a tradesman's billhead. This serves two objects, the tradesman gets a good advertisement which has brought in many a contract, and the private resident when the bill comes in receives an object lesson on the advantages of the telephone service. In considering the value of this advertisement from the private resident's point of view one must take into account the cumulative effect that, say, five or six of these billheads being sent into a house by different tradesmen must have, each one of which bears the tradesman's name and address and telephone number and the words "Orders received by National Telephone receive prompt attention." A supply of these billheads is given to every tradesman who signs a contract.

The results achieved in Portsmouth strengthen me in my conviction that the above system, which I have very briefly described, if not an ideal one is at any rate on the right lines, and is, I submit, worthy of a trial.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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TELEPHONE HOUSE, VICTORIA EMBANKMENT LONDON, E.C.

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CHEAPER TELEPHONES.

"CHEAPER telephones" is the unending and somewhat wearisome cry of the would-be friends of the telephone user; and, like the Irish and, unfortunately, the Unemployed questions, is always with us. The self-appointed champions of the public would, if they understood the question better, turn their eyes sometimes in the direction of increased efficiency and rapidity instead of gazing on the cheap rates of Switzerland and Sweden with that stedfast and almost adoring rapture to which we are so well accustomed. They are haunted by the ghost of some problematical £4 or £5 rate under which the fortunate subscriber can wallow in unlimited conversation, be the system never so large, and the junction circuits never so intricate and expensive. One critic hazards a guess that under an unlimited rate the subscriber when his telephone becomes too busy promptly orders another line; but actual experience shows a general disposition on the part of the flat rate subscriber to overwork the telephone, and that he rarely takes a second telephone until he has need of three or even four connections. To the inexpert mind the figure of the subscriber getting his £4-worth out of his line, trying in vain to obtain connection with a similarly employed subscriber whose number is in consequence generally engaged, presents no blot on the fair picture, nor does that of the telephone administration working at a loss and excogitating some new tariff scheme whereby they may, as unobtrusively as possible, find some economic relief. This part of the picture the prophet of cheap rates does not throw into relief.

The recent agitation against the measured rate has, singularly enough, been chiefly at the hands of large users to whom, above all subscribers, a perfect and rapid service is essential and who can, in general, afford to pay a fair price for it. Yet the experience of the Company tends all in one direction, and every contract office could confirm the fact that the important, busy firms gladly pay more for a first-class service when they are convinced of its merits. To be supplied with an instrument in every department, to have such a number of lines to the exchange that one or more is always available for inward and outward calls, to have one's traffic handled by an expert operator at one's own private switchboard and conveyed without delay direct to the ear of the person concerned is naturally a more costly proceeding than the old style of two or three direct lines and sundry extensions. It may take some time to convince the large user that it is worth while paying more for such a service, but once he is convinced it is always the same tale: on no account would he go back to the old state of affairs.

A somewhat lengthy and singularly ill-informed article has appeared in two or three provincial newspapers suggesting that telephone development in England is handicapped by dear service. England bears comparison, and favourable comparison, with all the important countries of Europe; if it be compared with America, the mention of cheap rates has no point. England has been handicapped in the telephone race, but not by rates. Every telephone man knows the reasons for our lagging behind America, and we need not recapitulate them here. The writer of the article resorts to the stock list of foreign rates—misleadingly set out. He is apparently not aware of the new measured rates in force in Austria, nor of those proposed in Germany, nor that the colossal American systems were built up on measured rates far higher than those in vogue in Great Britain. Finally he dives into history, and, adopting a "well-informed" pose, brings forth some mournful nonsense about "secret clauses" and a conniving Post Office. He has evidently been fishing in the muddy waters of some ancient newspaper onslaught on the Company.

THE CONFERENCES.

THE conferences recently held in Bristol, Birmingham, Manchester, Leeds, Edinburgh, Dublin and London, confirm in a gratifying manner—if such confirmation be necessary—the reciprocally beneficial effect of such meetings. The General Superintendent, and, in some cases, the Engineer-in-Chief, visited these centres, and thus in each of the provinces known to telephonic geography the senior officials of the staff from all parts of those provinces had an opportunity of discussing with the chief officers mentioned and with their superintendents several questions of pressing importance. There can be no gainsaying the great advantages of oral discussions of this nature. Questions can be put and answered; problems reviewed in all their bearings and elucidated; opinions invited and obtained, and, in short, more satisfactory results can be thus secured in an hour than by volumes of correspondence. Fresh currents of thought flew into the main stream, assimilating with it, augmenting it and strengthening its force. These interchanges of views are always stimulating and helpful, and the conferences referred to were a complete success. Moreover, a unique occasion was offered to a widely scattered staff to become better acquainted with one another, and for a renewal of acquaintance between the chief officers of the Company and their staff, and the good feeling engendered could not fail to strengthen the solidarity and loyalty of the staff—happily always manifest—and give sustenance to its robust *esprit de corps.*

THE VITALITY OF THE TELEPHONE SOCIETIES.

THE activity and vitality of the telephone societies is well evidenced by the programmes for the coming winter, several of which we have published. In fact, many papers have already been given, and by the time this issue of the JOURNAL is in print the session of 1908-9 will be in full swing. It might perhaps be imagined that as years go on some difficulty would be experienced in finding fresh subjects to treat of at succeeding meetings. The difficulty, however, hardly seems to exist for, if we may adapt a quotation from *Antony and Cleopatra* to the telephone art—

> "Age cannot wither nor custom stale
> Its infinite variety."

The fact is that large subjects, such as transmission, traffic problems, switchboard practice and the like can only be touched upon in a single paper, and leave plenty of scope for further efforts. Moreover, things move so rapidly in the telephone world that the problem exhaustively handled in 1906 may be worthy of careful reconsideration in 1909; and traffic and wayleave questions vary according to local conditions, and can also be dealt with from many points of view. We are glad to see that the operators' societies are still flourishing, and wish them every success.

Although there has been no lack of interest in the societies and no paucity of attendance at their meetings, some of the local committees are making special efforts to obtain good attendances. That of the Nottingham Factory Society especially commends itself to us. Four prizes are given which are adjudged by the votes of the members, the number of whose votes is dependent on the number of their attendances. Thus seven attendances give the right to four votes, six to three votes, five to two votes, and four to one vote. Plumping is allowed, but no member may vote for a paper which he has not heard read. This procedure not only ensures the judgment of the prize by popular suffrage but gives a stimulus to regular attendance. The syllabus card is altogether most business-like, and amongst its list of officers are stewards, registrars, a timekeeper and an official reader.

The societies increased greatly in number last session; a similar increase this winter would see nearly every district furnished with its telephone society—"a consummation devoutly to be wished."

BANKS AND TELEPHONES.

THAT strange form of conservatism (to which we have often before alluded in these columns) which disdains or neglects, through want of knowledge, to avail itself of modern appliances and conveniences, and which was formerly well exemplified in the case of the police, still finds a notable exponent in many large banks.

The recent exploits of the enterprising Mr. "D. S. WINDELL" who, thanks to the non-existence of telephonic communication, succeeded in robbing a well-known bank of some hundreds of pounds is a case in point. Had the various branches of the bank been connected by telephone, the knowledge that such a ready means of instant communication existed would probably have prevented the fraud being attempted. It is surprising that the able men who manage the banks with such wonderful success and control such vast financial operations should need to be told that, apart from the security which they would derive from being in telephonic connection with their branches throughout the United Kingdom, they would find when once used that the telephone was absolutely indispensable in carrying on their business in a safe and speedy manner. It is said that two or three years ago the swindle would have been impossible, and that only the invention of the taximeter had placed the *coup* within the thief's power. Surely it is always necessary to meet bigger guns with thicker armour-plate.

HIC ET UBIQUE.

THE following remarks by Elbert Hubbard, an American comico-didactic writer, will no doubt give some useful hints on business qualities to such English readers as can master the difficulties of the language:—

In every business house there are two distinct classes of employees. One we may call the Bunch, and these are out for a maximum wage and a minimum service. They are apt to regard their employer as their enemy, and in their spare time they persistently "knock." They keep bad hours, over-eat, over-drink, over-draw their salaries, and are "off their feed" at least one day in a week.

The other kind get their sleep, take their cold baths, do their Emersonians, join no cliques, and hustle for the house.

If I were a youth I would not compete in the twelve-dollar-a-week class. Like George Ade, who left Indiana and went to Chicago in order to get away from mental competition, I'd set the Bunch a pace. I would go in the free-for-all class. I would make myself necessary to the business.

No matter how "scarce" times are, there are a few employees who are never laid off, nor are their wages cut down. These are the boys who make the wheels go round. And it isn't *brains* that count most; it is *intent*. The difference is this: The Bunch plot and plan for personal gain—for ease and a good time. The other kind work for the house, and to work for all is the only wise way to help yourself.

OUR Cheltenham correspondent, Mr. W. A. Taylor, sends us the following somewhat gruesome cutting from the *St. Louis Post Dispatch*. A further outlet, he says, appears to have been found for the superfluous energies of our Contract Departments:—

Mrs. Pennord, a wealthy woman farmer, of Louisana, has just had her tomb built. In the lid of the coffin are several air holes, and a telephone is placed near the head rest, and is connected with the house of the cemetery keeper. Thus, the fear of being buried alive is reduced to a minimum. The tomb has become an object of interest to visitors.

AN advertisement for a caretaker in a small Devonshire exchange brought in some curious replies. One applicant stated that he was 34 years of age and full of promises. Another that he was 47 years of age, married, no family, and rather ambiguously remarks, "if necessary, could add to household."

THE TELEPHONE MASONIC LODGE.

THE second regular meeting of the Telephone Lodge took place at the Gaiety Restaurant, Strand, on Oct. 17. Bro. F. O. Harke occupied the chair. In the absence of Bro. Goddard, the junior warden's chair was occupied by Bro. Kenway. Bro. Dr. Franklin, P.M., P.P.G.W. West Riding Province, was unanimously elected an hon. member, and Bro. John Scott was elected a joining member. The following brethren were advanced a stage:—J. R. B. Gall, M. S. Stephens, J. Prescott, Jas. Hudson, V. Baldwin, Dudley Stuart, C. W. Salmon, Chas. Edwards and Wm. Aitken; and Messrs. H. J. Dunstan, F. W. Hibberd, R. J. Payne, F. H. Blackford and E. A. Laidlaw were initiated. The following candidates were duly proposed for initiation:—Messrs. F. C. Hawker, W. V. Pegden, C. Elliott, H. J. Maclure, C. F. Street, A. Watts and J. A. Hunt. During the evening a telegram was despatched to Bro. Goddard at Queenstown conveying the good wishes of the members of the lodge for a safe voyage. At the banquet which followed opportunity was also taken of congratulating Bro. Harke on the distinction of London rank which has been conferred upon him by Grand Lodge.

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from p. 154.)

Many petitions were presented. I have an official print of that from the Common Council of the City of London and of Leeds.

Having now mentioned Rowland Hill, I may say I have found that Sir Rowland Hill, mercer, Mayor of London in 1550, caused to be made divers causeways both for horse and man; it is curious that he proves to be an ancestor of the inventor of the system of prepayment of postage by stamps, as the bearing of the condition of the roads on the carrying of letters is so important a consideration.

He was a benefactor to Christ's Hospital, and founded a grammar school at Drayton, Salop. From his brother, General Lord Hill and Sir Rowland Hill are descended. His niece by her marriage with Alderman Sir Thomas Leigh, of Salop, was the ancestress of Lady Palmerston, Earl Cowper, the Duke of Marlborough and the Duke of Leeds.

This Sir Rowland Hill lived in Walbrook and was buried in St. Stephen's, Walbrook.

Without waiting for the stamps to be issued, on Jan. 10, 1840, the 4*d.* rate was lowered to 1*d.* by Statute 3 & 4 Victoria, c. 96, but there was no notification to the public.

It occurred, however, to those entrusted with bringing the new rate into operation, that the plan should be begun under favourable auspices, and it was resolved to issue envelopes for the use of the members of Parliament at the new rate of postage, and the following notice was distributed to the members on Jan. 16, 1840:—

"Letter covers (envelopes) which will pass free through the Post Office are prepared for the use of members of Parliament, and may be bought at the Office for the sale of Parliamentary papers, in the members' Waiting Room.

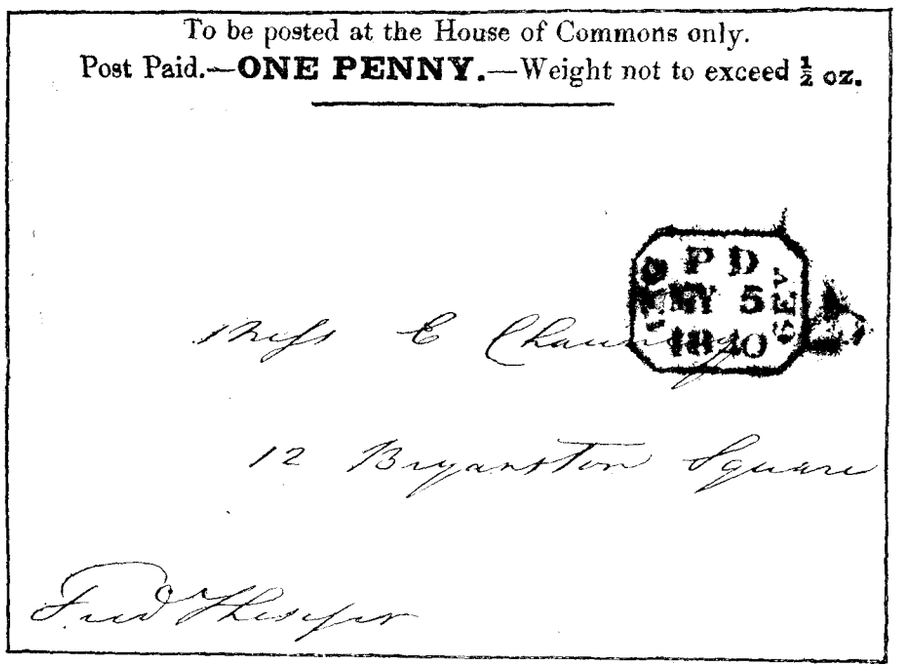
"These covers being available for the House of Parliament only will be charged if posted elsewhere.

"The last bag from the House for the General Post will in future be dispatched at 6.30.

"The covers will pass free by the London Penny Post, if put into the bags after two o'clock."

The Speech from the Throne contained the following:—

"I have lost no time in carrying into effect the intention of Parliament by the reduction of the duties in Postage, and I trust the beneficial effects of this measure will be felt throughout all classes of the community."



These envelopes are of peculiar interest as connoting the earliest but tentative approval of Rowland Hill's great plan of uniform Penny Postage, and also as being the first with an official notification on the face of the reduction in the postal rates; and thus the franking system passed away.

There are three varieties of the envelopes:

1. For the House of Lords, red imprint.
2. For the House of Commons, black imprint.
3. For the Houses of Parliament, black imprint.

As you know, there has been a recent proposal made (March, 1906) in Parliament to bring again into force the franking of members' letters.

During this time the Treasury had invited designs and suggestions, for, as Lord Crawford, the President of the Royal Philatelic Society, said, what was wanted to make the plan of Penny Postage feasible was

(1) *A Design.*—Involving *shape* and *size*. In this he was helped by the action of the Treasury, who had offered a reward for the best design; but the study of some 3,500 proposals sent in only taught him what to avoid.

The actual first idea of the stamp is a rough pen and water-colour sketch made by himself in 1839.

(2) *Material.*—Involving examination, testing, and trials of many kinds of paper, the incorporation of chemicals in its substance, whether hand-made or machine, matters of safety in the form of water-mark, etc.

(3) *Reproduction.*—The vast numbers which would be required must be practically identical. If not a fraud would arise at once. But any departure from identity must be evidence of forgery. To consider letterpress, lithography, engraving.

(4) *Inks.*—Involving the wide field of chemical nature—colour-permanency, cancellation, resistance to the cleaning off of cancels (whether water-colours or oil), fugitive, etc.

(5) *Attachment.*—Involving searches on adhesive matters—gums and cements, as they were then called.

(6) *Economy of Production.*—Always dominant, with the Treasury as watch-dog for the country.

Now comes the time for the stamp collector. By the bye, I may add here that the word "philately" was first used by Monsieur Herpin, of Paris, and was derived from the Greek *philos*, fond of, and *atalia*, exempt from tax.

The earliest Press notice of the collection of used postage stamps was a letter from Mr. S. F. Cresswell to *Notes and Queries*, in 1860. A Mr. Moody issued the first catalogue in 1862, listing about 300 varieties.

One hears the terms, stamp, proof, essay, applied in a haphazard way. It may therefore be of interest to consider what constitutes—

1. A stamp: The impression must be taken from a plate duly approved and authorised by the Commissioners of Inland Revenue.
2. It must be struck upon paper bearing the water-mark assigned to the face value denoted.
3. It must be in the colour approved, but not necessarily the colour in which the imprimative sheet was struck; for example, the 2*s.* was registered in blue, but when subsequently changed to brown, no sheet in this colour was officially preserved.

The question of perforation does not affect the matter. Perforation is merely for the convenience of Post Office officials and the public, and has no official signification whatever in relation to franking power.

Proofs must be impressions from the die or plate, and are always in black; a new design or any alteration in a previous one (excepting the plate number) is approved of from proof impressions from the die prior to the construction of the plate. Then essays for colour are taken from the plate, the Post Office and Inland Revenue select, and the sheet, if on the proper water-marked paper, becomes *ipso facto* a sheet of stamps, the sheets in other colours remaining what they always were—essays of colour.

Summarised: To constitute an impression a stamp, it must have franking power, which it obtains by its conformity with three essential conditions given; the absence of perforation, the fact of non-circulation, or mere official intentions, cannot deprive it of this power.

In reply to an invitation from the Treasury, the public sent in many proposals and essays for stamps, and I am able to show you some of the noteworthy essays, including those by Thomas Whiting, who introduced Sir William Congreve's system of multicolour printing; by William Wyon, and some by unknown authors; as well as the Ninth Report and the covers, etc., proposed by the Committee themselves for the London District Post, but not adopted.

They were to be printed on Dickinson's paper, having certain silk threads embodied in it. In connection with which I have heard Pope's simile quoted:

"Pretty in amber to observe the forms
Of hairs or straws or dirt or grubs or worms;
The things we know are neither rich nor rare
But wonder how the devil they got there."

Of the large compound essay Philbrick & Westoby write:

"Mr. Whiting printed some of his most remarkable designs on a sheet of plate paper. The designs are enclosed in a highly ornamental embossed frame, surrounded by a rectangular border of engine-turned work in green, measuring 8¾ inches by 11 inches."

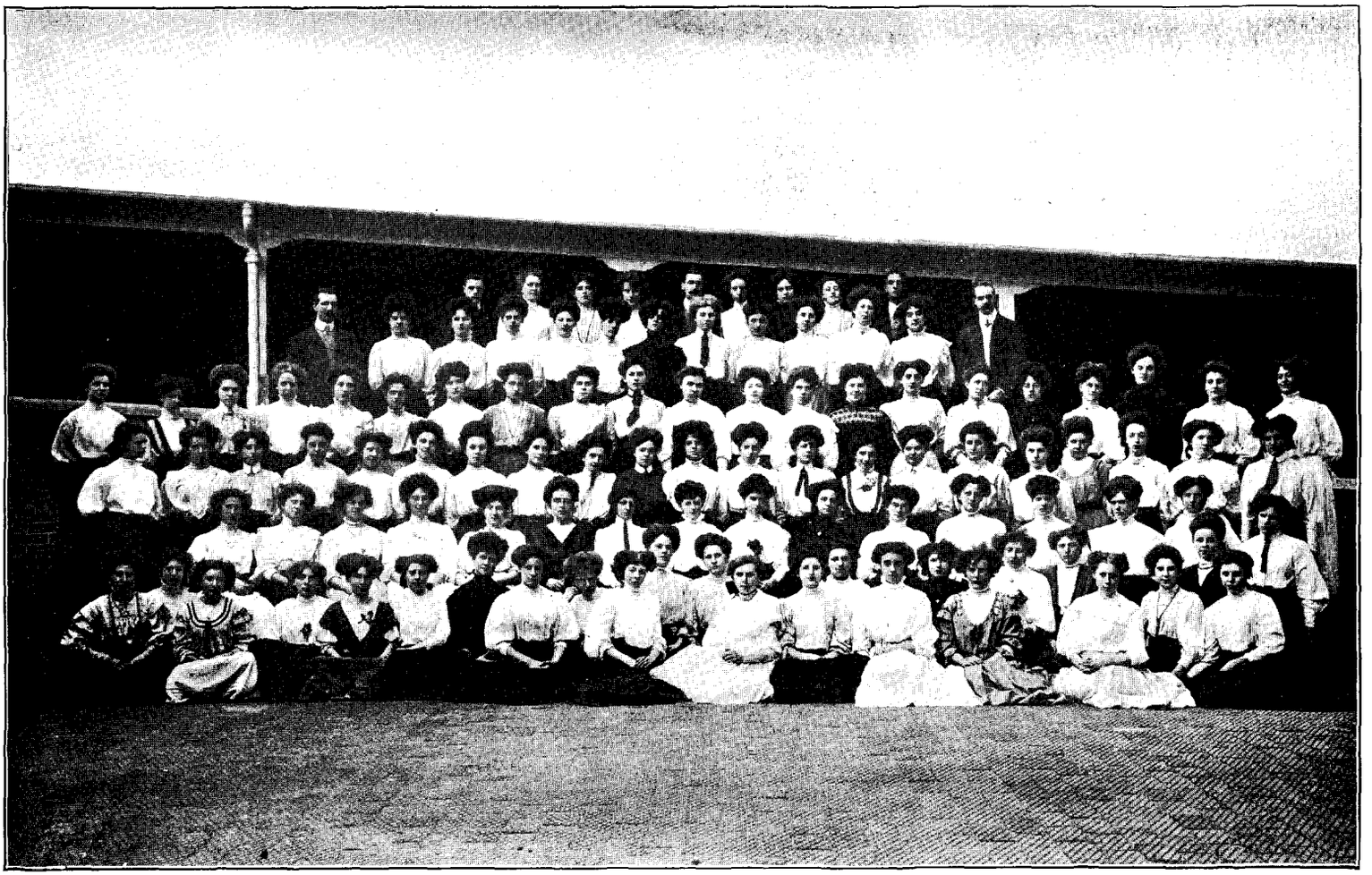
This specimen shows the various styles and beauty of Mr. Whiting's work to great advantage, but has unfortunately become rare. I am able to give you some details of the manufacture. In this essay we have the combined result of machinery engraving, of embossing, and of compound-plate printing, lately introduced in England by Sir William Congreve, which is a highly efficient method to prevent forgery, in contradistinction to the copper-plate or *en creux* method. The compound plate in two colours at back is the first operation. The design in red is from a plate of itself, as is also the green; one being pierced, and the other exactly fitting into.

The second proceeding is the printing of the blue and red impression in centre of harp by raised plates.

Thirdly, the embossed head is struck.

Fourthly, the harp is embossed.

The green border and ground is produced by printing from raised impressions made by the rose engine upon a metal plate.



BIRMINGHAM OPERATORS' TELEPHONE SOCIETY.

One suggestion submitted to the Committee in 1839 was for the use of a stamped wafer which would pay the postage and at the same time seal the letter, and I have the patent specification for this taken out by James Bogardus.

In bringing his scheme for the use of adhesive stamps to a successful issue Mr. Rowland Hill was assisted by Mr. Morris, of Messrs. Ashurst, Morris, & Crisp (and to Mr. Frank Crisp I am indebted for some valuable information on this subject), and by the great firm of Messrs. Baring Brothers, who financed and published the *Post Circular*, used to distribute knowledge on postal matters, debates on the subject in Parliament, the getting up of petitions, etc. I have the official minutes of the Court of Common Council for the City of London resolving to send such a petition, and that the sheriffs, attended by the Remembrancer, do wait upon some lord in Parliament, and that they do present the petition to the House. As you know, the result of the Committee's deliberations was the adoption of the Mulready sheets and envelopes and the well-known 1*d.* black adhesive labels. It should be borne in mind that in all official circulars, etc., the Mulreadys were called "stamps," and adhesives "labels." In anticipation of this issue the Post Office sent out the circular to postmasters, dated April 25, 1840, which I show, instructing them how to make the red compound and how to obliterate the labels and stamps, red being chosen, as it had always in the past been used to indicate that the postage had been paid. The term used for the obliteration, Maltese cross, is incorrect, it being properly a *cross paté*. The suggestion of the Mulready has been ascribed to the artist of that name, but somewhat incorrectly, as will be found by reference to Sir H. Cole's book, *Fifty Years of Public Life*. Mulready was only consulted after the Committee awards were made, and did not even submit a design to it. There were only four awards—one each to W. Cheverton, C. Whiting, Sir Henry Cole, and, I believe, Perkins, Bacon & Co. I am indebted to W. Alan Cole for allowing me to inspect Sir Henry's papers, memoranda, etc., which he collected when at the Treasury and associated with and assisting the Post Office Reform movement.

Penny Postage was sanctioned from Jan. 10, 1840. I have a letter postmarked on Jan. 9, the last day of the old rate and the first day of the new rate.

Having obtained Inland Penny Postage, the idea of Ocean Penny Postage was suggested by Elihu Burritt, called "the Learned Blacksmith," an American, who when visiting England observed the commercial value of cheap postage for communications and the assistance which it might be towards the advent of Universal Brotherhood, which sentiment is expressed on some of the envelopes he designed to forward his scheme.

At this time the postage to America was 1*s.* by steam pacquet and 8*d.* by sailing vessel.

Burritt proposed a 1*d.* rate for the inland service, 1*d.* for the ship and the usual rate for inland delivery.

The following account of the proceedings is compiled from *The Times* and the *Daily News* of Feb. 11, 1893:—

"A deputation of the Postal Committee of the Imperial Federation League was received by the Postmaster-General at the General Post Office, St. Martin's-le-Grand, on Feb. 10. The object of the interview was thus described in the circular announcing the meeting:

"'To press upon the Postmaster-General the following points, in view of the probable adoption of the penny rate for over-sea letters:—

1. That to whatever countries the penny letter rate may eventually be extended, it shall be first applied to countries within the Empire.

2. That a specially designed British Empire penny stamp, with a distinctive mark for issue in each country of the Empire, be introduced for this particular service.'

"Mr. E. W. Beckett, M.P., said that the archives of the Post Office contained a long correspondence which had passed between Mr. Henniker Heaton, M.P., and the late Mr. Raikes, in which the case in favour of the Imperial Penny Postage was fully stated. Universal experience pointed to the fact that when a reduction was made in the case of postage it eventually paid and paid well, fully recouping the outlay many times over. He understood that something like £75,000 per annum was paid in the form of subsidy to steamship companies, but as, on the other hand, £100,000 was paid to France and Italy for the conveyance of overland letters to India and Australia, he thought the cost of any further subsidy to steamship companies might be saved by avoiding, as a general rule, the overland route. For those who require it the 2½*d.* rate might be retained for letters specially carried by the present route. Moreover, cost might be saved by encouraging traffic to Australia through Canada, subsidy being paid to a line of steamers between Vancouver and Sydney."

(*To be continued.*)

TELEPHONE WOMEN.

XXVII.—ADA E. KNAPMAN.

MISS KNAPMAN first entered the telephone service on Jan. 22, 1892, at the original Hop Exchange, and her recollections of that event are somewhat amusing in the light of the quiet working of the modern exchange. She had to wait for some considerable time outside the building, the noise inside drowning her brother's knocks at the door and finally they had to open the door and introduce themselves to the clerk-in-charge. It is only just to say that, although of course the discipline was then not such as the work now requires, the noise was not entirely due to the lax methods of the person in charge, but to the system of operating then in force, which necessitated shouting from one room to the other. At the same time the present-day operators would be quite aghast if they saw their clerk-in charge engaged in fancy work, but Miss Knapman states this particular lady, who shortly left to be married, made nearly the whole of her *trousseau* in the exchange.

Miss Knapman remained as operator at the Hop for about seven years, with the exception of a period at Clapham, and was made supervisor in July, 1899, at Avenue under Miss Ralph, being subsequently transferred to Holborn in a similar capacity in the following October; there she remained about two years, and earned for herself among the operators the ambiguous epithet of the "modern Sherlock Holmes," and a reputation for strictness which Miss Knapman thinks preceded her transfer to Gerrard in September, 1901, as her advent was dreaded by the operators of whom she was to be placed in charge. One feels, however, that these girls had not long to wait to find that if their supervisor was strict on matters of discipline, that justice went closely hand in hand with it, and

ADA E. KNAPMAN.

those who have been privileged to gain a keener knowledge of Miss Knapman cannot but admire the unswerving uprightness which has always characterised her service in the Company, and the kindness and generous feeling which she shows towards her colleagues.

She was appointed Senior Supervisor-in-Charge in December, 1903, and when the new exchange was opened at Brixton in March, 1904, Miss Knapman, was placed in charge. Owing to the growth of the exchange, she gained the classification, in January last, of Clerk-in-Charge.

The exchange is situated in Gresham Hall, which is in architecture very like a chapel. The Angell Town Institution, as it was first called, was built in the year 1857, and prior to the erection of the Brixton Hall in 1889, some twenty years ago, was used for public meetings and concerts, and on Sundays for religious services. In these early days it was the only hall Brixton possessed, and for many years was used on weekdays as a high-class school for young ladies, and on Sundays by Mr. Aldous for about 24 years for afternoon services for young people of the middle class. For a very long period a religious sect, the Christadelphians, used it in the evenings, and the South London Choral Society for its concerts. In 1885 the building was accidentally burnt down, but was soon rebuilt on much the same plan as before. The name was later changed to Gresham Hall. Of late years it was not a financial success, and eventually passed into the possession of the National Telephone Company, who made it an exchange for Brixton and its neighbourhood. Before the common battery system was installed, the interior of the building was altered, and the general aspect made more businesslike. Visitors on their way to attend meetings in the neighbourhood would occasionally be found wandering disconsolately round the building. One very dejected coloured clergyman being found in the tea-room brightened up considerably when told he was in the wrong place.

Since Miss Knapman has been at Brixton the exchange has increased from 136 subscribers and 77 junctions to over 1,200 subscribers and 182 junctions. She is extremely fond of operating, and finds her work most interesting. She is also fond of reading, and her recreation is found in some branches of Church work.

XXVIII.—BEATRICE ASHMEAD.

THE present Clerk-in-Charge of Battersea Exchange entered the telephone service in May, 1892, as operator at the Bank Exchange, then familiarly known as "Queen Vic.," and which has long since been merged into the present Bank Exchange.

BEATRICE ASHMEAD.

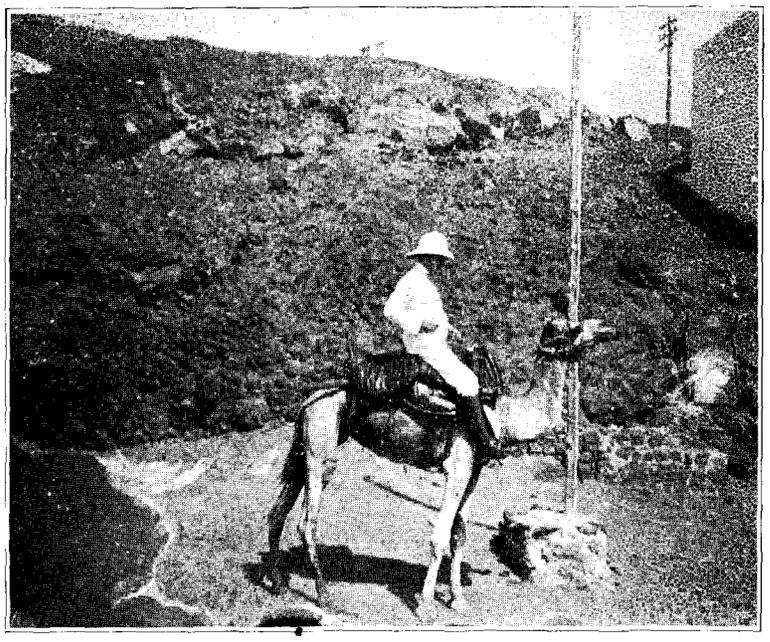
Subsequently she was transferred to the Hop, which was then in the Hop Market building, from which it derived its name, and her recollections of the condition of things in connection with the so-called dining and retiring room only serve, in common with others who had the same experiences, to make her more fully appreciate the modern comforts which are provided. Miss Ashmead's first promotion was in January, 1900, as Supervisor at Avenue; in August, 1901, she was transferred in a similar capacity to Gerrard, where in March, 1904, she was made Senior Supervisor. Of this exchange she has the happiest recollections, and regrets that she could not remain sufficiently long there to witness the change over to the new central battery system, but further promotion came to her in November, 1906, when she was made Clerk-in-Charge at North. During her appointment there the memorial tablet erected

in this exchange to Michael Faraday was unveiled by Lord Kelvin.

In September, 1907, a vacancy occurring at Battersea for a Clerk-in-Charge, and this exchange being in close proximity to her home, the Company acceded to Miss Ashmead's request to be transferred to that position.

Miss Ashmead, who is a Londoner by birth, confesses to no hobbies, but gives what spare time she has to Church work in connection with St. Mark's, Kennington. Her staff, to whom she is most approachable, look upon her as a friend and real "helper" in their work, and have a genuine regard for her success.

THE TELEPHONE IN ARABIA.



A CORRESPONDENT in Aden kindly sends us the above photograph, which, he says, will give some idea of the circumstances under which line inspection is carried out in the Arabian Desert.

TELEPHONES AT THE STADIUM.

BY W. V. PEGDEN, *Sales Manager, London.*

ON the occasion of the *Evening News* Sports and Marathon Race held at the Stadium, Franco-British Exhibition, on Saturday, Oct. 10, the National Telephone Company was requested to submit a scheme whereby each person in the Stadium could obtain the result of each event directly completed, also to know the progress of the Marathon Race at five, ten, fifteen and 23 miles. At the centre of the Exhibition side of the Stadium, the Press representatives were located, and here an exchange line was fitted with an extension to each end of the Stadium, where a huge board was erected. In the Press box was fitted a magneto instrument and a twin vulcanised indiarubber was run out on to an 8-feet pole by the side of the cinder path, then down the pole and along a wood edging by the side of the cement track. A magneto instrument was teed at each corner and centre of east side, the window blocks being fitted inside a wooden box about 4 feet square. By the side of each instrument was placed a man with a megaphone who, directly a result was sent over the line, announced it to the crowd. Within a minute of each result every person had the name of winner of the competition and the time taken to complete. The chief megaphone man was the well-known figure we have been accustomed to see standing by the side of our late General Manager at the Annual Staff Dinners (the toastmaster).

The installation gave every satisfaction and proved a big success. Within an hour of the last competitor arriving from Windsor the whole installation was cleared from the Stadium.

W. E. L. GAINE MEMORIAL PORTRAIT.

THE half-crown reproduction of this portrait is now obtainable. It is an excellent print from a costly photogravure process, and members of the staff desiring a copy should apply as early as possible to Mr. F. C. Hawker, Telephone House, Victoria Embankment, E.C.

A "TELEPHONE" IN 1835.

THE following article, reprinted from *Leigh Hunt's London Journal* for July 25, 1835, kindly sent to us by a correspondent in the Dublin switchroom, is interesting chiefly as making an early use of the word "telephone." The operation referred to seems, however, to have been rather in the nature of a Zancig performance than the science as we understand it:—

M. SUDRE'S TELEPHONE.

MONSIEUR SUDRE, a native of France, exhibited on Wednesday, July 8, in the King's Concert Room, at the Opera House, a public demonstration of his "Musical Language."

He opened his lecture by some observations on the nature of language in general, as the means of conveying thought from mind to mind; and then, by a variety of satisfactory proofs, established the applicability of music to this purpose.

The audience were supplied with small slips of paper, upon which several ladies and gentlemen wrote sentences. Each sentence was then handed to Monsieur Sudré, who translated it into musical sounds with his violin, while an assistant, so situated as to be within hearing of the sounds, but beyond the reach of personal communication, was engaged in translating the music back again into the very words of the sentence.

After hearing the music the assistant wrote down, not the substance, but the exact words of each sentiment, on a black board, in large letters of chalk; and the correctness with which he performed this office seemed to give great satisfaction to the company, and to interest their feelings on behalf of the ingenious inventor.

We select a few from the numerous examples:

"La telephone peut elle seule être le langage de savants."
"Le genie s'impose tôt ou tard."
"Amitié entre l'Angleterre et la France."
"L'humanité vous sera reconnoissante de cette invention."
"Honneur a l'inventeur."
"Les arts valent mieux que la politique."

Monsieur Sudré also exhibited the efficiency of his "Musical Language" when written in musical character, by a familiar course of experiments, and gave examples of a new foreign language, founded upon musical notes.

The inventor seems to entertain sanguine expectations of inducing mankind to adopt his system as a universal language, but in this he is attended rather by our good wishes than our hopes.

His more moderate view of applying it to telegraphic communications seems better founded, though even that seems beset, at the very threshold, by the awkward necessity of securing a fair wind from the weather office.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

THE following grants were made during September:—

Construction Department (*a*)	£5	10	0
,, ,, (*b*)	4	0	0
Traffic Department	1	8	0
Engineering Department (*a*)	5	0	0
,, ,, (*b*)	3	0	0

Total number of grants made to date, 101.
Total amount of such grants, £292 10s. 3*d*.
Donation received: W. W. Cook, Esq., £1 1s.
Number of members at Sept. 30, 1908, 2,777.

OPERATORS' HOLIDAY THRIFT CLUB.

MISS MAW, Chief Operator, Scarborough, writes:

A thrift club, which proved very successful, was formed last October at the Scarborough Exchange by the operators. It was resumed this October, and for the benefit of other exchanges who might like to form one I give the following rules, which are most rigidly adhered to:—

1. The money is collected on pay days.
2. Each member is required to contribute every week, if only a small sum.
3. No withdrawal can be allowed until the holidays.
4. The deposits are collected by the chief operator, who is the secretary.
5. Any breach of the regulations forfeits the membership.

In addition to the above a separate deposit is made by the operators for withdrawal at Christmas.

I might add that every operator who entered appreciated the benefit derived from this club last year.

THE LARGEST TELEPHONE DIRECTORY IN THE WORLD.

EMPLOYEES of the New York Telephone Company and the New York and New Jersey Telephone Company, which operate the telephone service of New York and vicinity, have recently been distributing the summer telephone directories, the total edition of which *exceeds one million. At the time the new directories are distributed* the old ones are collected in order that the old directories. which have become incomplete and incorrect, due to changes of telephone numbers and new installations, shall not be used. Correct directory information is essential to good service, and consequently the telephone companies call in their old directories whenever they distribute a new edition. In view of the size of the present summer edition, this means that over 2,000 tons of paper will have to be moved by the companies' distributing force.

The telephone directory of New York and vicinity has become a very important book, for it is not only the handbook of the telephone user, but it has also become the general directory of the city, and is consulted by hundreds of thousands of people daily, who look in the book to find names, addresses, street numbers, etc.

There are in New York and vicinity at the present time approximately 450,000 telephones. The scope of the book, which contains the listings of practically all of these telephones, can be readily seen.

In 1879 the telephone list of New York was printed on a small card and contained the names of only 252 subscribers. Since that time, with the rapid growth of the telephone business, the book has been rapidly growing in size, the book of Feb. 10 of this year being nearly a foot square, with over 800 pages and weighing over three pounds. This overgrown book was so unwieldy to handle, and the physical difficulties of printing and distributing such a book were so great that the telephone companies worked out a plan of dividing the directory into smaller volumes, which are more easy for subscribers to handle, and which makes directory information more easily obtainable.

Under the new plan, subscribers in New York City receive a New York City directory, which contains the listings of telephone subscribers in the five boroughs of New York City, these listings to be in three separate alphabetical groups; Manhattan and the Bronx, Brooklyn and Queens and Richmond; and also a general suburban directory, which contains the listings of telephone subscribers in the suburban sections of the metropolitan telephone area as follows:—New Jersey, Suburban Long Island, Westchester County and Rockland County. Each group is a complete alphabetical list of all telephone subscribers in that section.

Subscribers in the suburban territory receive a New York City directory and a suburban directory, containing the listings of all subscribers in or adjacent to the particular suburban section in which the book is distributed. All subscribers in the section are listed in one alphabetical group.

In addition to these books, each suburban town is provided with a small local list. These local directories, which have been issued formerly in only a few suburban towns, have been found most convenient, and accordingly arrangements have been made to issue them in all towns throughout the suburban area.

The New York City book and the general suburban book are a trifle larger in dimensions than the present directory, but do not contain as many pages, and will be easier to handle. The type pages of the new books have been designed with care, and although the type face is of necessity small, it is exceptionally clear and legible. The pages being a little wider, give more margin, which is an improvemnnt.

In the new directory the listings of the telephone numbers of the various city departments have been rearranged, all listings appearing in one group under the general heading, "City of New York." Up to the present time the listings of the various departments, bureaus, board and commissions of the city government have been listed under separate headings, the listings being scattered throughout the book. The new arrangement of listing these various departments under the general heading, "City of New York," is a great improvement over the old method, as all the New York City department listings are in one place, and thus can be found more easily.

A new feature of the suburban directory is the elimination of the local town headings, all subscribers in a suburban section, such as New Jersey, for instance, being listed in one alphabetical listing group. It is felt that this method will be a great improvement over the old way of listing subscribers of each little town under the town heading. With a number of small communities throughout the suburban area it is difficult to remember and find in the present telephone directory the exact town heading under which the person to be called is listed. With all subscribers in any given area listed in one alphabetical group this difficulty is obviated.

The telephone companies maintain a special directory department, where twenty expert copy makers are constantly employed under the supervision of the directory manager. To this department daily reports of all new and changed names for the directory are forwarded, and from these reports copy is made for the printer. This copy is forwarded every day, and a small supplementary list of telephone directory changes, called the *addendum*, is printed each day and furnished to all of the central offices throughout the territory, in order that information desks of the central offices may have the latest directory information.

The printing of the directories is a stupendous job and requires a very large and specially equipped printing establishment. When a new edition of the telephone book goes to press, the shop works day and night, Sundays and holidays, in order to get out the directories with the least possible delay.

The New York City telephone directory is in 24 "signatures" or sections, and is printed on a specially made Hoe press, which turns out 7,500 printed sheets of 144 pages each every hour, all properly folded in book form. Each section is transferred from the press to the gathering machine, where all are brought together and stitched, making the book ready for the covering machines. A covering machine, which automatically attaches covers, will cover approximately 1,600 books an hour.

The distribution of the edition of telephone directories to subscribers is another big job and requires a small army of men. In Manhattan and the Bronx alone some 400 men, with twenty trucks and a large number of small delivery wagons, are employed doing delivery work. The method is to ship the books in quantity to various points throughout the city. From these points the men carry out the books to subscribers, leaving the new directories and collecting the old. A receipt is obtained for all directories delivered. In the suburban sections, the directories are delivered by means of delivery wagons, of which about 100 are in use during the directory distribution period.—*American Telephone Journal.*

CORRESPONDENCE.

TRAFFIC REDISTRIBUTION.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I AM obliged to Mr. Rodger for his kindly criticism of my paper *re* above, but he makes one or two statements on which I should like to join issue with him.

In the first place I quite agree with his remarks *re* "scientific" method; figures are very necessary and helpful as far as they go, but in a matter of this description they do not go far enough. For figures to be a real help they must be representative and accurate.

It is a practical impossibility to obtain, over any set period, an absolutely normal condition of things to apply to all unlimited lines; in any large town or city we are bound to get a certain percentage of these lines with either abnormal or subnormal traffic. A staff holiday with one subscriber, death of a principal with another, a slump in business, a sudden rise or fall in stocks, a gale, a fire and so on; these are things you cannot possibly allow for, but which would naturally affect any scheme built up on the result of any week's record. Even taking the 160 "busiest" numbers at Bristol we never get them "all" consistently busy or quiet, it just depends upon the particular business they represent and the condition of that business in relation to the market.

But, on the other hand, assuming we "could" obtain favourable conditions all round, would it be reasonable to expect that individual loads could be accurately recorded by the operating staff? The very fact of redistribution being required points to overloading! Therefore, if on the top of this, the

task of recording individual calls from individual numbers was imposed, the operator, already overloaded, would be bound to make sufficient error to be fatal to useful traffic statistics; for it must be borne in mind that no help could possibly be afforded her, as she alone would be able to book her calls: there would be no question of team work or supervision coming to the rescue, so that I very much question the obtaining of the relative "busy-ness" "*without doubt*"; there *would* be a doubt and a sufficiently serious one to make one consider ways and means of bettering the method and improving the record.

Having had experience of both methods I can unhesitatingly vote for the scheme adopted at Bristol, both for the searching nature of the deductions and also the excellent results obtained. This paragraph also applies to the concentration of "money box" lines.

I should also like to point out that the scheme was not built up on a collective "opinion," but a collective "experience"; this makes a vast difference.

The filling in of lines not noted did not affect the load in any way (the supplemental article, October issue, proves this), and this happening is not attributable to "luck"—nothing was left to luck. The same result would obtain in any exchange going through a similar process.

The questions of Sunday calling, junction calls and auxiliary lines were all considered and dealt with in the same way as suggested by Mr. Rodger; but with reference to the last, even if auxiliary lines called on the same panel, what assurance is there that the same operator would answer the second as the first number? At any rate there is none where team work exists.

Bristol, Oct 6. A. E. COOMBS, Exchange Manager.

CENTRAL BATTERY INSTRUMENTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REPLYING to Mr. Speight's references to my article in the September issue, I must inform him that it consists of extracts from a paper read before one of the London telephone societies last session, and much explanatory matter contained in the paper had to be omitted in condensing for the JOURNAL. Mr. Speight infers that the bell coils form part of the speaking circuit, and remarks that it seems "rather curious"; were such the case it would be very curious, but, needless to say, the bell coils do not form part of the speaking circuit. Looking at Fig. 2, page 117, Mr. Speight can consider the bell disconnected, if that will make the case clearer; then, on speaking into the microphone, two sets of impulses are sent out to line: (1) pulsating currents pass out to line through the 15ω coil in series with the microphone; (2) the microphone also forms part of a circuit consisting of the receiver, 30ω coil and condenser; while transmitting the potential difference across the microphone terminals varies, causing the condenser to charge up and discharge through the 30ω coil which acts as a primary by reinforcing the pulsating currents in the 15ω coil. Mr. Speight further remarks that only casual reference was made to the exchange repeater coil; it was only casually mentioned, as it had no direct bearing on the subject under consideration. When present a repeater coil does act in the way indicated by Mr. Speight, but if he is regarding it as vitally necessary to transmission, it is only necessary to remind him of such circuits as those on private branch boards when extension speaks to extension, and other circuits that can readily be called to mind which do not include a repeater.

Paddington. J. H. STEWART, Exchange Electrician.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to Mr. Speight's remarks in the October JOURNAL in connection with Mr. J. H. Stewart's article on the above, I must confess that in considering this, I agree with Mr. Stewart in his statement that "the 15ω winding works as a secondary, the 30ω winding being a primary for outgoing speech." There are two effects—No. 1, due to an alteration in the ohmic resistance of the line circuit, caused by any variation of microphone resistance—let this be assumed to be a decreased resistance. This, of course, increases line current. No. 2 is due to a current in the 30ω winding, set up by the condenser discharging, consequent upon a reduction of transmitter resistance due to No. 1. This current in the 30ω winding induces a current in the 15ω winding in the same direction as the original increase of current (due to increased transmitter resistance) to which it adds itself, thus giving a greater variation of line current. Therefore, since the 15ω winding has a current induced in it from the 30ω winding, it may be said that the former acts as a secondary. It is, of course, quite clear that the bell is not considered as part of the talking circuit.

Oct. 19. W. D. SCUTT, Chief Inspector, Leeds.

PRODIGALITY IN CORRESPONDENCE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to the editorial in your October issue, may I suggest that the writer of it has probably not read the article in question carefully enough, as many points in it he appears to overlook or misapprehend.

Apart from this, there are just two points which might be mentioned, viz., (1) that the chief typist at Head Office was consulted at the outset, and some experiments were made before the suggestion was proceeded with, her opinion being that its introduction would mean letters typed quicker than before and just as easily, and (2) the suggestion has been adopted by the Company.

London, Oct. 17. P. H. C. PRENTICE.

[We do not plead guilty of failure to read Mr. Prentice's article carefully, and we are in sympathy with much of it. With reference to the points cited we fear our opinion as regards No. 1 is unaltered. As regards No. 2, Mr. Prentice overstates the case in saying that the suggestion has been adopted by the Company. It has been adopted by such departments and such districts as thought it of advantage.—EDITOR, "N. T. J."

LOCAL TELEPHONE SOCIETIES.

Bristol.—The first meeting was held on Oct. 14 when two papers were read. Mr. W. E. Babidge read a paper on "Common Battery Switchboard Construction and Junction Working," and Mr. F. G. Eager's paper was on that fruitful subject of discussion, "Faults." Mr. Babidge's paper was so lucid and so comprehensive as to leave practically no room for discussion. Mr. Eager's paper was excellently written and very well delivered, and it was filled with interesting information, with here and there quaint touches of humour. It was followed by a lengthy discussion, which proved very useful and instructive—in fact, the discussion had to be curtailed owing to lack of time. Mr. Perkins presided in the absence of Mr. Dalzell, and he expressed his pleasure at again seeing so many members of the staff at the meeting. He stated that he thought that the papers which would be read during the session would prove useful to every member of the staff, and he therefore urged the necessity of the meetings being well attended in the staff's own interest.

Swansea.—A meeting took place on Sept. 22, the District Manager, Mr. W. E. Gauntlett, occupying the chair. The following officers were re-elected for the ensuing session:—President, Mr. W. E. Gauntlett; vice-presidents, Messrs. R. Williamson and H. G. McArthur; secretary, Mr. W. H. Crook; treasurer, Mr. R. A. Skinner; and a committee representative of all departments. Some interesting papers were promised, and a successful session is anticipated.

Luton.—The annual general meeting of this society was held on Oct. 5, when the following officers were elected:—President and chairman, Mr. J. H. Wilson; hon. secretary, Mr. G. F. Beck; hon. treasurer, Miss Whitmore; committee, Miss Stratford and Messrs. G. H. Smith, S. J. Cain and H. Parr.

Liverpool and Birkenhead.—The first meeting of the session was held on Oct. 8, when 134 members and friends gathered to hear the address of the president, Mr. E. J. Hidden. The address, which dealt with the health of the Company, the district and the staff in regard to the past and the future, was very interesting, and closely followed by those present. After the address the members were entertained to some very interesting slides, and the evening closed with a hearty vote of thanks to the president. The syllabus for the session 1908-9 is as follows:—1908: Oct. 8, presidential address, Mr. E. J. Hidden; Oct. 22, "Transmission," Mr. Cohen; Nov. 19, "The Observation Table," Mr. S. N. Aickin; Dec. 17, "Measured Rate Accounting," Mr. A. C. Godfrey. 1909: Jan. 21, "Operating." Miss Ferguson; "The Monitors' Table," Miss Lee; Feb. 18, "Common Battery, Private Branch Exchanges," Mr. H. Crowley; March 18, "Costs, etc.," Mr. Wolstenholme; April 15, competition night, ten-minute papers. Prizes of £1 1s. and 15s. will be awarded for the two best papers. All papers to be in the hands of the president by April 8.

Bristol Operators.—The syllabus for 1909 session has been completed, and includes papers by Mr. A. E. Coombes, Exchange Manager; Miss Nicholls, Clerk-in-Charge; Mr. S. O. Allen, Exchange Manager, Birmingham; Mr. E. S. Cooper, Contract Manager; Mr. R. A. Dalzell, Provincial Superintendent; and an operators' night. These will be held monthly on Thursdays, and a successful session is looked for.

Warrington.—That the formation of a telephone society in the South-West Lancashire district is appreciated by the staff was evidenced by the successful opening meeting which was held on Oct. 14, a very convivial evening being spent at Atkinson's café. The Provincial Superintendent, Mr. R. Shepherd, who has kindly consented to act as president, presided over an attendance of 60, including ten lady members of the staff, and delivered a very appropriate inaugural address. Being a strong believer in the societies, he pointed out the advantages to be derived from them. A paper was read by Mr. W. Haynes on "Chemistry as Applied to Primary Batteries." A good deal of information was imparted as to the types, action and faults of cells, the methods of overcoming detriments, and various improvements were suggested. An interesting discussion followed, in which Messrs. R. Shepherd, H. Chambers, W. Beattie, A. Spargo, T. Kenyon, J. H. Langley and F. Eastwood took part. An enjoyable programme, consisting of songs, recitations, and pianoforte solos, was submitted by the following:—Messrs. J. W. Dean, T. Taylor, W. Haynes, E. L. Owen, V. O. Standen, and Miss M. Peake. The following papers have already been promised, and if these can be taken as a criterion, the success of the society is assured:—"Engineering Notes," Mr. J. Ewing; "Switchboards," Mr. H. Clynes; "Overhead and Covered Distribution," Mr. W. Beattie; "Planning and Laying of an Underground Scheme," Mr. A. Spargo; "Small Power Plant," Mr. J. H. Langley; "Fitting," Mr. H. Sherrington; "Operating," Miss L. Skelland; "Latest about Telephones," Mr. J. W. Dean; "Auto-Boxes," Mr. F. Eastwood; "Overhead Construction," Mr. T. Day; and "Cables," Mr. Stuart.

Portsmouth.—The first meeting of the Portsmouth Telephone Society was held on Oct. 8, 1908. The paper was given by Mr. Pharo, Traffic Manager, on "Provincial Telephone Traffic." Comparison was drawn between the London conditions and provincial conditions of operating and general traffic arrangements. There was a good attendance, and a discussion took place after by Mr. Smith, Mr. Albany, Mr. Yates and Mr. Lees. The District Manager (Mr. S. J. Smith) was in the chair.

London.—Arrangements are now being completed for the ensuing session, which commenced on Oct. 28, 1908, and meetings will follow on the last Monday and Wednesday alternately in each month, until April, 1909, in Hall 201, Salisbury House. Promises of the following papers have been received; others may be added if necessary:—"Private Branch Exchanges," Mr. G. F. Greenham; "Some Business Troubles and Suggestions," Mr. J. Stirling; "The Technical Side of Development Study," Mr. Harvey Smith; "Calculation of the Capacity of Accumulators used in Central Battery Exchanges," Mr. H. Bishop; "Correspondence by Telephone," Mr. G. Goldsmith; "Notes on Engineering

Construction," Mr. J. M. Shackleton; a traffic subject, Mr. H. Corner; a special subject, Mr. W. W. Cook; "Junior Competition," by the Junior Members. A lantern (electric) is at the disposal of members for the purpose of illustrating their papers. At the end of each session, with the view to encouraging the junior members to study various subjects and write papers thereon, a competition is held and prizes awarded to the successful competitors, and it is hoped that all members will do their utmost to bring before the notice of all employees of the Company who have not yet joined the society the advantages and benefits the society offers. The secretary, Mr. W. K. Cherry, Salisbury House, will be glad to give the fullest information, and to receive the names of those intending to join for the session. Terms of membership—Entrance fee, ladies 6*d*., gentlemen 1*s*.; subscription, ladies 1*s*., gentlemen 2*s*.

Southern London.—The general meeting was held on Sept 24, when the following officers were elected:—President, Mr. P. J. Ridd; vice-president, Mr. W. Blight; hon. secretary and treasurer, Mr. G. H. Cole; committee, Messrs. F. G. Brown, G. H. Bryant, T. M. Inman, J. T. Leete, J. McLeish and F. M. Ward. The general meeting was followed by the first lecture of the session, the paper being read by Mr. H. Bines on "Magneto Exchange Faults." The paper was illustrated by lantern slides, and proved very interesting, the various faults met with and the clearance of same being clearly shown.

Wolverhampton.—The opening meeting of the North Midland District Telephone Society was held Oct. 16, when about 80 members attended. The chair was taken by the vice-president, Mr. Archer W. Smith, District Manager. Mr. John Scott, the Assistant Provincial Superintendent, very kindly attended in response to an invitation from the local committee, and was unanimously elected a vice-president, Mr. Coleman kindly agreeing to continue to act as president. Mr. Smith, in his opening address, referred to the satisfactory progress of the society in the past year, in which the total membership had numbered 78, and an average attendance of 54 for the meetings had been kept up. The papers of this session promised to be of great interest, amongst others being "Transmission," by Mr. F. C. Baldwin; "The Apprentice," Mr. J. Dring; "Lightning Effects on Dry-Core Cable," by Mr. R. S. Grosvenor; "Views and Interviews," Mr. F. Lucas; as well as short competitive papers for the three prizes offered to members of the junior and outside construction staff. The chairman also made appreciative reference to the distinctions gained by the district in the results of the Correspondence Classes and in the local technical examinations.

Under the auspices of the local Staff Transfer Association, Mr. Scott then very kindly gave a detailed account of the work accomplished by the central committee of the association up to date, and in a most concise manner dwelt on the present situation, the current negotiations and the prospects before the staff generally. At the end of a most able address, on his volunteering to answer any questions that might be submitted by the members of the staff, a most lively and pertinent discussion ensued on a number of debatable points, which he answered. At the conclusion of the meeting he was very heartily thanked for his presence and the help he had given to the staff.

Cardiff.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 15, "Outstandings," Mr. J. Mills (Cardiff); "Wayleave Department Work" (criticised by Mr. Hooper), Mr. D. Driscoll (Newport); Nov. 12, "Operating," Mr. Napier (London); Dec. 17, "Line Construction," competitive papers. 1909: Jan. 15, "Common Battery Working," Mr. S. F. Whetton (Cardiff); Feb 18, "Instrument Inspection," competitive papers; March 18, "Costs," Mr. Dalzell (Bristol). It has been decided to run the society on the same lines as last year, viz., subscription 1*s*. each for members of the staff in receipt of 10*s*. or more per week joining society, and 6*d*. for members earning less; an allowance to be made to members attending the meetings from the out-centres towards their railway fares. The society has also been fortunate in again securing St. John's Schoolroom to hold meetings in. The first meeting was held at St. John's Schoolroom on Oct. 15, Mr. W. H. Kirk, vice-president, in the chair. There was a good muster. Two papers were read, the first of which was by Mr. Mills (District Office), entitled "Outstandings." In the course of his paper the lecturer outlined the general method of dealing with this particular branch of the Company's business, and pointed out that a great many delays in payment of accounts occurred in consequence of the deposits not being fully explained before agreements were signed, and urged the necessity for special care in this direction. He also pointed out that during the last eight years, whilst the percentage of outstandings had considerably gone down, the revenue had gone up. The next paper was read by Mr. Driscoll (Pontypridd) on "Wayleave Department Work." He fully outlined the work of a wayleave officer and dealt with the various difficulties met with by him in the course of his work. The paper was very ably criticised by Mr. Chas. Hooper (Cardiff), and most interesting discussion followed. The evening was then brought to a close with the usual vote of thanks.

Nottingham.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 23, "A Good Telephone Service," G. Rastall; Nov. 20, "The Contract Officer," T. Justin; Dec. 11, "Operating." "Operator." 1909: Jan. 8. "Exchange Construction," F. H. Roberts; Jan. 22, "Development Studies," W. Crompton; Feb. 12, "Dry-Core Cables," E. Morley; March 5, "Instrument Maintenance," A. L. Mantle and W. Parker; March 26, "Overhead Construction," F. Hopps and T. Townsend; April 17, "Power Apparatus," E. Earp.

Nottingham Factory.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 12, "Switchboards, Past and Present," Mr. J. E. Stanton; Oct. 26, "Metallurgy," Mr. F. C. Pinder; Nov. 23, "Common Battery Instruments," Mr. J. W. Faulkner, "Electricity in the Workshop," Mr. P. Linay; Dec. 7, "Dynamo and Motor Construction," Mr. F. Bardsley. 1909: Jan. 11, "Transmission," Mr. B. S. Cohen; Jan. 25, "Relays in Telephony," Mr. H. R. Honick; Feb. 22, "Workshop Practice," Mr. A. E. Ault; "Timber Troubles," Mr. W. H. Buxton; March 22, "Early Telephones," Mr. D. Macadie. The first meeting took place on Oct. 12, 175 being present. Mr. Fenton, who presided, expressed the conviction that judging from the papers sent in for competition, which were to be read to the society, the session promised to be a most interesting one. Mr. J. E. Stanton, Foreman of the Factory Switchboard Department, then delivered his lecture on "Switchboards, Past and Present." With the aid of about 50 slides, a general insight was given into the history of the switchboard, beginning with Coleman Street Exchange, London, in 1879; followed by views and diagrams showing the working of such types as the slipper board, Edison peg board, Gilliland peg board, Poole's pattern, Williams slide bar, etc., representing old types. These were followed by views and diagrams illustrating the magneto system, Ericsson's cordless, the latest common battery fire-proof switchboard, etc. A brief discussion brought a very interesting and instructive meeting to a close.

Plymouth.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 13, vice-president's address, Mr. G. Hooper, "Notes on Transmission," Mr. A. R. Wran; Nov. 3, "Maintenance of a Scattered District," Mr. W. C. Harris; "Operating," Miss E. Crocker; Nov. 24, "Dry-Core Cable Jointing and Practical Demonstration," Mr. F. Hardy; Dec. 15, "Transmission," Mr. B. S. Cohen. 1909: Jan. 5, "Wireless Telegraphy," Mr. J. R. Leighton, "Telephony from a Draughtman's Standpoint," Mr. C. Mullins; Jan. 26, "Telephone Troubles," Mr. F. Knight; "Magneto Working," Miss E. E. Westlake; Feb. 16, "Testroom Work," Mr. R. S. Harris; "Stores," Mr. G. S. Annear; March 9, "The Securing of Contracts," Mr. J. Ritchie; "The Value of Periodical Inspections," Mr. B. H. Sanderson; March 30, "Contract Department Experiences," Mr. A. T. J. Williams; "Faults," Mr. R. G. Balle. Most of the papers are by junior members of the society. The first meeting of the present session took place on Oct. 13, when Mr. G. Hooper, District Manager, gave an opening address in which some very interesting figures were introduced, showing the working expenses for the year ending June, 1908, also the capital expenditure and the results obtained during the same period as regards new business. On comparing these figures with those of the previous year, considerable improvement was found in many directions, more especially as regards new business obtained. Following Mr. Hooper's address, Mr. A. R. Wran, Local Manager, gave some interesting notes on "Transmission." The meeting accorded a hearty votes of thanks to Messrs. Hooper and Wran for a very instructive and enjoyable evening.

Portsmouth.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 8, "Provincial Telephone Traffic," Mr. S. J. Pharo; Oct. 27, "Electrical Induction," Mr. T. Collins; Nov. 10, an open evening on "Knotty Points"; Nov. 24, "Central Battery Working," Mr. J. Lees; Dec. 8, "The Erection of Lead-Covered Cables," Mr. H. J. Yeates. 1909: Jan. 12, "Cables and Transmissions," Mr. H. Legge; Jan. 26, "Dynamos and Motors as applied to Telephony," Mr. S. J. Pharo; Feb. 9, "Service Observations," Mr. H. Newnham; Feb. 23, special.

South Midland.—The syllabus for the session 1908-9 is as follows:—1908: Sept. 21, annual meeting and election of officers; Oct. 12, "Canvassing Experiences," Mr. F. B. Farrand; Nov. 16, "Gerrard Exchange," Mr. S. H. Ings; Dec. 14. "Some Notes on Management," Mr. Jno. Scott. 1909: Jan. 18, "Notes on Engineering Construction," Mr. J. M. Shackleton; Feb. 15, "Manipulation of Dry-Core Telephone Cables," Mr. F. G. C. Baldwin; March 15, short paper evening. A prize will be given to the writer of the best paper, which must not last more than five minutes when read. A general meeting was held on Oct. 12, Mr. J. Mewburn (president) presiding over an attendance of seventeen members and five friends. The president gave a few opening remarks upon the value of belonging to such a society, and the need for each member to do what he possibly could to extend its aims. Mr. F. B. Farrand then proceeded to give a very graphic paper dealing with "Canvassing Experiences." This was followed by a considerable amount of discussion, when the following points were forcibly brought out:—Development of Tamworth Exchange; the main idea prevalent being that it was too isolated, and that it should be linked up with Nuneaton. Pushing private lines and sales, and the necessity of knowing the location of gangs as a help to canvassers acquiring new business. At the close of the meeting the chairman presented to Mr. S. H. Ings, Inspector-in-Charge at Leamington, a handsome clock on the occasion of his recent marriage.

Cardiff Operators.—The inaugural meeting of the session 1908-9 was held on Oct. 13, the president, Mr. B. Waite, being in the chair. There were 64 per cent. of the members present, as well as the vice-presidents. The programme was a competitive one, four papers being read by the Misses K. Warmington, H. Faulks, A. Smart, and W. M. Baugh, the subjects being respectively, "Arguments Regarding Alteration of 'Number, Please,'" "Repetition or Non-Repetition of Numbers on Junctions" "Sub Exchange Working," and "Junction Call-Wire or Order-Wire Working." Four very interesting papers were listened to by the members, several very material points being brought out. The discussion was only very brief owing to the number of papers involved, but a pleasing feature of the meeting was the interest taken in the various subjects, several of the operators taking part in the discussion, in addition to the president and vice-presidents. These gentlemen acted as adjudicators at the request of the committee, and awarded the first prize of 7*s*. 6*d*. to Miss A. Smart, the second prize of 5*s*. being divided between Misses Warmington and Faulks, as they were unable to come to a decision as to which was really the better paper, both being considered of equal merit. The attendance and interest shown at the meeting augurs well for the continued success of the session.

Sheffield.—The first meeting of the session was held on Oct. 16, when Mr. H. Addy read his paper on "Photo Telegraphy," in which he lucidly explained the underlying principles of the French and German systems. The lecturer also explained how the motors driving the transmitting and receiving apparatus were synchronised, and described the auxiliary apparatus used by the two inventors,

illustrating his remarks with lantern slides. A short discussion concluded an interesting evening.

Birmingham.—The first meeting was held on Oct. 13. Mr. Coleman presided, and in the course of his remarks emphasised the importance of such societies to junior members, and suggested that a society should be formed for juniors only. A joint paper was then read by Messrs. Baldwin and Cornfoot on the new Midland Exchange which is to be opened shortly. The lecturers dealt with the subject in an able manner, and interest was considerably enhanced by a large number of lantern slides showing the various stages in the construction of the building, the method of leading in the cables, switchboard construction, etc. All the members of the society, with the exception of three, were present.

Birmingham Operators.—The work for the winter session has commenced, the officers elected being as follows:—President, Mr. E. Williamson; vice-presidents, Miss E. P. Eades, Messrs. C. W. Piggott and S. O. Allen; hon. secretaries, The Misses P. Dobbs and A. Morrall; hon. treasurer, Miss M. Spiers; committee, The Misses E. Williams, E. Adams, E. Pope, B. Hadley, H. Crowther, J. Bell, E. Poole, E. Eades, L. Clift and K. Jones. The syllabus for the session is complete, and amongst the items may be mentioned the visits of Miss F. Minter, London, and Miss F. Nicholls, Bristol. The first meeting of the session was held on Thursday, Oct. 15, the chair being taken by the District Manager, Mr. E. Williamson, when an address to the operating staff was given by Mr. J. Scott, Assistant Provincial Superintendent. The address was of extreme interest, and touched upon the relations of the operators to the Company and the benefit derived by the operator herself in the course of her duties, interspersed with anecdotes from Mr. Scott's personal experience. Mr. Scott also touched on the value of regularity, punctuality, politeness, etc., and the value of a business training. His remarks were very much appreciated, and a vote of thanks was passed by the lady members of the staff both to Mr. Scott and Mr. Williamson for their attendance at the meeting.

Newcastle-upon-Tyne.—The coming session was inaugurated on Oct. 2 by a smoking concert which was held at the Crow's Nest Hotel, Barrass Bridge, Newcastle. The president, Mr. F. W. Gaskins, was in the chair, and 80 members of the staff were present. A programme of songs and recitations, got together by Mr. Jordan, was very ably rendered by Messrs. Jordan, Byrne, Dryden, Lillico, Robson, Westwood and Coates, and a late member of the staff, Mr. Michael Welsh, who in a recitation, "The Football Spectator," made some clever hits with reference to telephone employment, which were much appreciated. Mr. Hopkirk was the pianist. During the evening the chairman announced the first meeting of the society, and also drew attention to the many advantages of membership. Votes of thanks to the artists and chairman brought to a close an exceedingly enjoyable evening.

Leeds.—First meeting of session was held on Oct. 7, chairman, Mr. W. R. Senior. The president of the society, Mr. W. V. Morten, gave an inaugural address—a clear and concise consideration of current conditions and claims.

Swansea Operators.—The first sessional meeting was held at the Hotel Grosvenor on Oct. 13, the chair being occupied by Mr. W. E. Gauntlett. The following officers were elected for the ensuing session:—President, Mr. W. E. Gauntlett; vice-presidents, Messrs. R. Williamson and W. H. Crook; secretary, Miss M. E. Campbell; committee, Misses C. Cook, A. Ellery, M. Cousins, M. Francis, M. Owen, J. Nicholls, W. Rowland and R. Smale; chairman of committee, Mr. A. G. Bristow. A short but interesting paper was afterwards read by Mr. A. G. Bristow on "The Service—Swansea and elsewhere," the proceedings being terminated by the usual votes of thanks.

NEWS OF THE STAFF.

Mr. F. A. CAIRNS has been appointed Chief Contract Officer in the Western district in place of Mr. Everett, who has resigned the Company's service. Mr. EVERETT on leaving was presented with a silver sovereign purse.

Miss ELSIE MCADOREY, Central Exchange, Manchester, has resigned to take up another position, and prior to leaving was presented with a gold bangle by her colleagues.

Miss A. FOSTER, Central Exchange, Manchester, has been promoted from Senior Operator to Supervisor, and Miss C. PATON, of the same exchange, has also been promoted from Senior Operator to Supervisor.

Mr. G. S. WALLACE, Chief Electrician of the Manchester district, has been appointed lecturer on advanced telephony, and Mr. JOHN HAYWARD, Chief Fitter, Manchester, has also been appointed lecturer on elementary telephony at the Municipal School of Technology, Manchester, for the coming session.

Miss M. PATTERSON has been appointed Clerk-in-Charge at the new Fortwilliam Exchange, Belfast.

Miss A. LOCKHART has been appointed Supervisor, Belfast Central Exchange.

Miss S. MCCRACKEN has been appointed Clerk-in-Charge at the new Knock Exchange, Belfast.

Miss R. RITCHIE, Senior Operator, has been promoted to be Assistant Supervisor, Belfast Central Exchange.

Miss M. MOORE, Senior Operator, Dublin, has been appointed Clerk-in-Charge at Rathmines.

Mr. W. H. WESTLAKE was presented by the Pontypridd staff with a dressing case and silver match-box, suitably engraved, on the occasion of his transfer to Bideford.

Miss HILDA E. WILLIAMS, Senior Operator, Cardiff, has resigned the Company's service to take up the nursing profession. Prior to leaving she was presented by the operating staff with a brush and comb mounted in silver, with the best wishesfor her future success.

Miss N. WATSON, Senior Operator, Central Exchange, has resigned after nine years' service to take another position. Her colleagues at the Central Exchange presented her with a silver manicure set.

Mr. G. E. SMITH, of the Brighton district office staff, was, on leaving the service, presented on Oct. 8, by the Brighton clerical staff, with a Swan fountain pen, leather brief bag and leather letter case. The Chief Clerk made the presentation and expressed regret on behalf of the staff at severing their connection with Mr. Smith, who suitably responded.

Miss G. M. TURNER, Senior Operator, Oldham, has been transferred to Ashton-under-Lyne Exchange as Clerk-in-Charge.

Mr. FRANK P. GRESSWELL, Hanley, has been certified as a teacher of telegraphy and telephony in connection with the City and Guilds Institute.

Mr. N. B. TOMLINSON resigned his position as Engineer at Croydon on Oct. 7, having obtained an appointment under the North Metropolitan Electric Light & Power Company. He was presented by the Local Engineer, on behalf of the local staff, with a fountain pen and collection of local views.

Mr. F. P. LINN has been transferred from the Hop Centre to take his place.

Miss I. MURRAY, Edinburgh Central Exchange, has been promoted from Supervisor to Monitor.

Miss M. ARTHUR, Edinburgh Central Exchange, has been promoted from Peg Operator to Supervisor.

Miss A. FERGUSON, Edinburgh Central Exchange, has been promoted from Supervisor to Travelling Supervisor for sub-exchanges.

Miss A. TAYLOR, Leith Exchange, has been promoted from Senior Operator to Peg Operator at Edinburgh Central Exchange.

Miss E. H. W. WATSON, typist, Edinburgh, was presented with a silver-backed brush on leaving the service.

London Traffic Department.—*Promotions and transfers:*

Mr. S. CREASEY, Exchange Manager, Paddington, has been transferred to the Maintenance Department.

Mr. J. F. MOYSE, Assistant Exchange Manager, London Wall, has been promoted as Exchange Manager to Paddington.

Mr. J. JENKINS, Assistant Exchange Manager, Paddington, has been transferred as Assistant Exchange Manager to London Wall.

Miss J. COOPER, Operator, Avenue, has been promoted to be Supervisor, Bromley. She was presented by her colleagues with a gold brooch and leather handbag.

Miss LONDON, promoted to be Supervisor, Gerrard, last month, should have been shown as previously being an Operator at Hop, not Holborn.

MARRIAGES.

Miss M. HAZELHURST, Supervisor, East Exchange, Birmingham, has resigned, in view of her approaching marriage, after nine years' service. She was presented with a silver preserve dish and sifters, and also a dinner service, by her colleagues at East and Central Exchanges.

Miss E. REDMOND, Senior Operator, Dublin Central Exchange, resigned on Sept. 3 to be married. The switchroom staff presented her with an overmantel.

Mr. A. BENNETT, Cashier, Plymouth, was presented with a handsome marble clock on the occasion of his marriage, which took place recently. The presentation was made by Mr. G. Hooper, District Manager, on behalf of the staff.

Mr. G. S. ANNEAR, Rentals Clerk, Plymouth, was the recipient of a dinner cruet and teapot, on the occasion of his marriage, which took place on Sept. 28.

Miss MARIAN WILLIAMSON, Operator, Wisbech, has resigned, in view of her approaching marriage.

Inspector S. WELCH, Portsmouth, was presented on Oct. 2, on behalf of the staff, with a handsome marble clock, on the occasion of his marriage. The presentation was made by Mr. W. Padget, the electrician.

Miss ALLEN, Senior Operator, Portsmouth, was presented on Sept. 12 on the occasion of her marriage with Mr. SHANNAHAN, of the Engineer's staff, by Mr. Smith, District Manager, on behalf of the staff, with a tea service. Mr. SHANNAHAN was presented with a silver-plated teapot by the members of the Engineering staff.

Chief Inspector J. J. BERRY, of St. Heliers, Jersey, was transferred on Sept. 23 from bachelor to benedict, on which occasion opportunity was taken by the staff of Jersey district to present to him a silver fruit and cake stand, the presentation being made in the presence of all the available members of the staff by the District Manager, Mr H. Eady, in a suitable speech.

Mr. E. E. RUSSELL, Timekeeper, Notts Factory, was the recipient of a set of cutlery from the joint Factory and Engineer-in-Chief's staffs, on the occasion of his marriage. Mr. C. E. Fenton (Factory Manager) made the presentation.

Mr. T. H. GREEN, of the Contract Department clerical staff, was the recipient of a handsome timepiece from the staffs of the Liverpool and Birkenhead districts, on the occasion of his marriage. The Contract Manager made the presentation on behalf of the staff, voicing their good wishes.

Mr. J. E. CLINCH, Contract Officer, Dover, was presented with a toilet set, the gift of the Dover staff, on the occasion of his marriage.

London Traffic Department.—*Leaving to be married:*

Miss M. RILEY, Operator, Avenue, on leaving to be married, was presented with a handsome pair of vases.

The name of the operator who resigned from Paddington Exchange in view of her approaching marriage should have been shown as Miss FUSEDALE, and not Frisedale.

OBITUARY.

It is with regret that we have to record the death through accident of THOMAS JOHNSTON, Foreman, Bristol, which occurred on Aug. 26 through falling whilst cutting trees in a suburb of Bristol. Mr. Johnston entered the service in 1899, and was a very valued servant of the Company. The funeral took place on Sunday, Aug. 30, when all departments were represented, and a wreath was subscribed for by his fellow-employees, About 100 of the employees were present.

STAFF GATHERINGS AND SPORTS.

Norwich.—A whist drive took place on Oct. 7 at the Criterion Restaurant, Norwich; 27 tables were set, 108 players competing for the fourteen prizes. The first prizes were taken by Mrs. Gaymer (ladies) and Mr. Ralphs (gentlemen). A pleasant interval for refreshment was interspersed with songs by Mr. R. H. Chapman and Mrs. Twiddy. Mr. Palmer acted as accompanist, and Mr. H. H. Wigg as M.C.

Swansea.—The opening of the third session of the Swansea Telephone Society was made the occasion of a social gathering of the members at the Adelphi Hotel, where a smoking concert took place on Oct. 16. Mr. W. E. Gauntlett (District Manager) occupied the chair, and several Post Office officials attended as guests. Some excellent singing rendered by members of the staff constituted the programme, the chief artistes being Messrs. T. Sagholm, J. Thomas, H. M. Kenworthy, H. G. McArthur, E. W. Thomas, W. Bevan, G. Wilson, T. Harris and W. Howells. Master A. Lewis also recited in good style. A hearty vote of thanks was accorded the committee for their efforts.

Bradford.—On Oct. 16 a very successful whist drive was held at the Vegetarian Restaurant, Bradford, under the auspices of the local telephone society. Mr. Wicker, the chairman of the society, presided over a very large gathering of the staff and friends. After the whist drive supper was taken, and followed by an excellent programme of musical items rendered by the various members of the staff. The following were the successful competitors in the whist drive:—Ladies: Miss E. Blackburn, Miss H. Whalley, Miss E. C. Hindle, Gentlemen: Mr. W. Blackburn, Mr. F. Dawson, Mr. Maskrey.

Birmingham.—The District Office, Contract, Engineering, Electrical and Traffic Departments all removed from the Newhall Street premises to the Company's new spacious offices in Hill Street during the week ending Sept. 26. To commemorate this event a whist drive took place on Sept. 30 at Fletchers' Café. About 190 members of the staff and friends were present, and the organisers are to be heartily congratulated on the successful and pleasant evening spent. The proceeds are to be devoted to a fund for the beautifying of the operators' sitting-room at the new Midland Exchange. Mr. Piggott officiated as M.C. Sympathy was felt for Miss Williams who first suggested this whist drive and intended carrying out all the arrangements herself, but was unfortunately prevented from doing so through meeting with a serious accident.

A society has been formed in this district by the staff, and named "The Entee Entertainment Society." Its object is to provide musical or dramatic entertainments at the social gatherings of the staff. The rehearsals, which are held weekly, have been the means of unearthing "talent" of no mean order, and great things are expected in the near future.

Edinburgh.—*Ampère Golf Club.*—The final of the Hole and Hole competition was played over the Braid Hills course in September when Messrs. C. L. Stewart and A. Robson defeated Messrs. J. H. Allan and J. Haig. The last competition for the season was played over Gorebridge course on Oct. 10, when Mr. W. Knox (Electrical Department) carried off first prize.

Portsmouth.—The cricket club in connection with The National Telephone Company's Portsmouth and district staffs has again been successful in competition and has won the Portsmouth Cricket Association's Cup in Division 2. It will doubtless be remembered that last year this team was in Division 3, and, beating all comers, won the cup with a good margin. In the ordinary sequence, they then went into Division 2, and now at the end of this cricket season they have been returned winners with several points in hand. The batting and bowling averages of the leading members of the team were remarkable—the leading bowler, W. Meech, finished up with the very fine average of 3·5 and, Mr. Shannahan with an average of 3·9. (Mr. Shannahan also headed the batting averages.) Altogether the cricket season has been a very successful one for the Company's team.

The Portsmouth football team are hoping to receive a visit from the Salisbury House team and are particularly keen to meet the winners of the Clay Challenge Cup. The secretary, Mr. J. Ireland, will be pleased to receive any communication that will lead to a match taking place.

NATIONAL TELEPHONE PROGRESS.

NEW exchanges were opened during the month at Warrenpoint (Dublin district), Limpley Stoke (Bristol), and Epping (Herts and Beds), making a total now working of 1,530; 1,844 stations were added during the month making a total of 468,958.

Contracts from the following hotels and large firms for private branch exchanges have been secured:—

IN LONDON.—South Kensington Hotel, three junctions, twelve stations, twelve automatic boxes. Bailey's Hotel, four junctions, twelve stations, twelve automatic boxes. Strand Hotel, six junctions, 41 stations, 20 automatic boxes. De Walden Court, two junctions, seventeen stations.

IN WARRINGTON DISTRICT.—Penketh Tanning Co., two junctions, fifteen stations. P. Walker & Son, three junctions, sixteen stations. Warrington Co-Operative Society, two junctions, fifteen stations. Dromgoole Bros., St. Helens, 2 junctions, thirteen stations. Eckersley Ltd., Wigan, two junctions, twelve stations.

IN BRIGHTON.—Grand Hotel, two junctions, six stations.

IN NORWICH.—Chamberlin's Ltd., five junctions, twenty stations.

IN LOWESTOFT.—Empire Hotel, five junctions, twenty stations.

IN BUXTON.—Empire Hotel, two junctions, twelve stations.

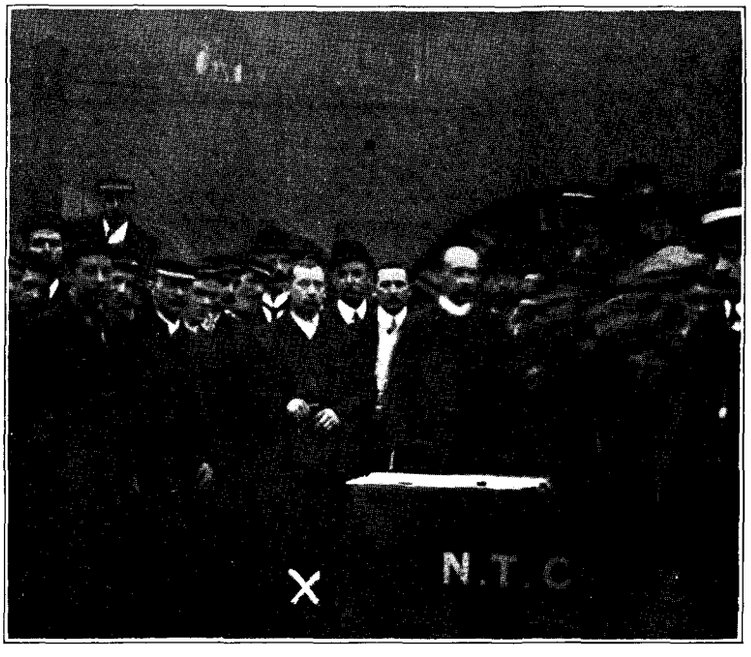
PORTSMOUTH.—The central switchboard is being extended by adding 480 calling lamp signals, increasing the multiple by 600, extending party line multiples round switchboard, and converting direct line and junction positions to combined direct line and party line working.

LOWESTOFT.—The cable in connection with the transfer of the Company's plant underground has all been drawn in.

CAMBRIDGE.—The necessary cable has been drawn in in connection with the transfer from overhead to underground which is being centralised on the premises of the Company's recently erected in Alexandra Street.

EATON (NORWICH).—An additional 50-line switchboard has been fitted. This doubles the capacity of the exchange since it was opened in May, 1905.

PRESENTATION TO PLUMBER GILL.



PLUMBER GILL, of the Manchester engineering staff, was, on the evening of Oct. 16, the recipient of a very interesting testimonial.

In July last an explosion occurred in a manhole in Piccadilly, Manchester, which resulted in two men being so overcome by the noxious fumes that they were in danger of losing their lives. Their escape was really due to the prompt and plucky action of Plumber Gill, who at considerable personal risk entered the manhole while the latter was full of gas, and, by means of ropes, hauled the men to the surface, from whence they were taken to the infirmary and eventually recovered.

The particulars were reported through the official channels to the Board of Directors, who instructed Mr. Shepherd, the Provincial Superintendent, to convey their appreciation of Gill's heroic service, and to present him with a purse containing five guineas, as a tangible token of that appreciation.

The presentation took place at the Manor Street Stores Yard, and Mr. Shepherd emphasised the pleasure he felt in taking part in the ceremony and in carrying out the wishes of the Board. Plumber Gill, amid much enthusiasm, accepted the gift, and modestly referred to his action as being simply one that he felt sure any of his mates would have done for him in similar circumstances. Mr. Magnall, District Engineer, also added a few words, expressing the satisfaction he felt in the kindly recognition which had been extended to the matter by Head Office and other officials. Mr. Shepherd was supported by the District Manager and other officers of the district, and a large and representative gathering of the staff also attended.

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TELEPHONE MEN.

XXXI.—JAMES WEBSTER CAMPION.

JAMES WEBSTER CAMPION was born on Feb. 25, 1869, at Spalding, in Lincolnshire, and spent the early years of his life in Reading and Cambridge. Educated at the Perse Grammar School, Cambridge, he was head of the Junior School in 1884, and passed the Cambridge junior local examination with honours in that year. In 1888 he entered the service of the United Telephone Company, and, to obtain a practical insight into the working of the telephone system, spent a short time in the exchange then existing in Mincing Lane. Shortly afterwards he was appointed to the Rentals Department at the Head Office of the Company, and, his abilities being soon appreciated, he was transferred to the Accountants' branch to assist Mr. E. Hare. Realising the great advantages of shorthand, he quickly made himself proficient and obtained the certificate of the Society of Arts. The departments under the Secretary's control being augmented by the creation of a travelling audit staff (of which Mr. Hare became senior auditor), Mr. Campion succeeded him as Head Bookkeeper in 1894. In 1897 he passed the Society of Arts examination in bookkeeping, receiving a first-class certificate and one of the Society's bronze medals, out of 3,435 candidates from all parts of the United Kingdom. In 1905 he was elected an Associate of the Chartered Institute of Secretaries. He has rendered yeoman service in connection with several Parliamentary Committees, in assisting in the preparation of statistics in support of the Company's case, and under the Secretary is responsible for keeping the books and accounts of the Company. He has afforded valuable aid in furnishing information for many of the papers submitted and discussed at the Annual gathering of Officers. Many changes in the methods of keeping the books of the Company are due to his initiative, and he never loses an opportunity of increasing the efficiency of his department without unduly adding to its cost.

He has won the esteem and devotion of his staff, and by his unflagging industry has inspired everyone in his department with that *esprit de corps* which has made it one of the most efficient in the Company's service. In him, as in the other members of the staff, the Post Office in 1911 will take over a live asset in every sense of the word, and while the Company's plant and property in the nature of cables, poles, wires, switchboard instruments, &c., are, by the Agreement with the Postmaster-General, to be valued, the Government will acquire without payment the priceless assets of the brains, and in many cases the devotion of a lifetime which have built up the wonderful and successful telephone business now existing.

In the early days of the National Telephone Company the accounts were prepared annually, but since 1894 they have been issued to the shareholders half-yearly, and under the present system the accounts are made up and the balance sheet issued to the Proprietors within six weeks from the closing of the books.

The capital expenditure of the Company on the great amalgamation in 1889 was about £2,500,000; it is now £14,000,000. The gross annual revenue was then about £300,000; it is now nearly £3,000,000. On the acquisition of the trunk wires by the Government in 1896, the fees collected on behalf of the Post Office in that year were about £70,000; for the current year they will probably amount to more than £450,000. These figures will give some idea of the increased work which must of necessity have fallen on Mr. Campion's department.

Mr. Campion is much interested in music and art and has taken advantage of his holidays to visit many foreign countries, seizing the opportunity thus afforded of making acquaintance with the wonderful works of art to be seen in the celebrated galleries of Paris, Dresden, St. Petersburg, Florence, Venice and other places on the Continent.

PROFESSOR AYRTON, F.R.S.

BY AN OLD "CENTRAL" STUDENT.

THE death of Professor W. E. Ayrton, which occurred on Sunday, Nov. 8, will have stirred the feelings of thousands of his old students, of whom a number are now with the Company, for ever since 1873 he had devoted his energies to teaching the practical application of physical science.

His first educational appointment was to the Professorship of Physics and Telegraphy at the Imperial College of Engineering at Tokio, Japan. Prior to this he had spent several years in the Indian telegraph service, where he worked out and brought into use the earliest method of allowing for the insulation resistance in locating faults on long telegraph lines. In 1872 he returned to England to superintend the manufacture of the Great Western telegraph cable, and in the following year he left for Japan. He returned in 1878, and the next year accepted the position of Professor of Applied Physics at the City and Guilds of London "Local Trades School," an institution which developed into the Finsbury Technical College. In 1884 he was transferred to the Professorship of Electrical Engineering at the newly established Central Technical College at South Kensington, a position which he held until his death. He was made a fellow of the Royal Society in 1881, and elected President of the Institution of Electrical Engineers in 1892.

The numerous contributions made by him, often in collaboration with others, notably Professor Perry, to the journals of the Royal Society, the Institution of Electrical Engineers and other scientific associations are evidence of the enormous amount he has done for his profession. The part of his work best remembered is in connection with electrical measurements, for, like his early master, Kelvin, he was imbued with the importance of accurate quantitative investigation. Every student is familiar with the Ayrton and Perry ammeter, the instrument for which this word was originally coined, the universal shunt, and the Ayrton and Mather galvanometers. During the later years of his life he was engaged on the design and construction of a new electrical balance for the absolute determination of the unit of current. His work extended through all branches of electrical engineering. He was one of the pioneers of electrical traction; his researches on the accumulator form a classic; acting with Perry and Fleeming Jenkin he put into operation the first electrical "telpherage" system.

But important as Professor Ayrton's investigations have been, his influence on the thousands of students he trained has had perhaps a greater effect. The intense earnestness, the energy and restless activity which were his chief characteristics did not fail to impress those working under his guidance. He insisted on personal effort on the part of the students. "You must think for yourselves!" He arranged the work in the laboratories and the lectures with this as the chief aim. In the laboratory the student was told what he had to do and left to himself to find out the way to do it. It was impossible to take connected notes of his lectures. They were too interesting, indeed, exciting and teemed with suggestions and offshoots which he intended his hearers to follow up themselves. There was always a rush for the front seats and always, when the lecture was finished, a crowd around the lecture bench listening to his explanations of points not clearly understood. In the exercise class which followed the lecture, the "Professor's questions" were regarded with dismay for he was an adept at propounding "teasers." Towards the end of the writer's course at the Central Technical College, he introduced the practice of allowing the use of lecture note books in examinations. They were of little use; the questions were always set in such a way as to demand individual and original thought, and a student was given no credit for his paper if it did not show this quality.

He continually impressed on us the importance of scientific research applied to engineering problems, and, as an example of the enormous results to be attained, quoted Pupin's application of self-induction in telephone transmission. He did not hesitate to use mathematics of a higher order than any his hearers had yet dealt with, relying on them to prove his results for themselves. He insisted on logical reasoning down to fundamental facts; the writer recollects more than one occasion when he harried the class by repeatedly asking, "Yes, but why?"

An able mathematician, he never lost sight of the physical meaning of each expression. Yet, whenever possible, he used simple and direct reasoning from first principles in preference to mathematics, and his clear and, when once stated, obvious explanations, fixed the facts in our minds as no amount of mathematical analysis could have done.

The great fault he found with English students as a whole was that they failed to become enthusiastic in their work. At home he did not find the energy and devotion which he met among the world's younger nations, America and Japan, and it was a real sorrow to him that he was unable to create these qualities in all his students in his own country. But it was few that he did not stimulate to earnest and painstaking work. An English student is unwilling to betray his emotions, and perhaps Professor Ayrton did not realise that his spirit had indeed infused itself into all of us, some in a greater degree, some in a less.

His life was the fullest possible exposition of his philosophy, the whole of which is summed up in the following words from his presidential address to the Institution of Electrical Engineers:—"He who works with his whole soul knows no drudgery."

One realises now, more than ever, the enormous value of a training under such a man, and an increased gratitude for his influence and teaching will temper the sense of loss which all his students must feel at his death.

TELEPHONE SOCIETIES.

THE particulars of the following telephone societies are to hand:—

Name of society.	No. of members.	Entrance fee.	Subscription.	Is there a library?	Meetings held every
Birmingham	75	*Nil.*	1s.	—	Month in Co.'s office.
Birmingham Operators	110	*Nil.*	*Nil.*	No.	„ „
Blackburn ..	83	6*d.*	1s. per week.	Yes.	Month in outside hall.
Bristol ..	80	*Nil.*	—	No.	Month in Co.'s office.
Bristol Operators	50	*Nil.*	*Nil.*	No.	„ „
Cardiff	72	*Nil.*	1s. where salary over 10s. 6*d.* where salary under 10s.	—	Month in outside hall.
Cardiff Operators	56	*Nil.*	*Nil.*	No.	Month in Co.'s office.
Chester ..	26	1s.	*Nil.*	—	Month in outside hall.
Coventry ..	17	*Nil.*	1s.	—	„ „
Dublin ..	80	*Nil.*	Membership card 2*d.*	Yes.	Three weeks in Co.'s office.
Dover ..	45	*Nil.*	Senior staff 1s. Junior staff 6*d.*	No.	Month in Co.'s office.
Hull ..	45	6*d.*	1s.	Yes.	Fortnight in outside hall.
Leeds ..	86	*Nil.*	1s.	Yes.	Fortnight in Co.'s office.
Leicester ..	50	*Nil.*	6*d.*	Yes.	Fortnight in outside hall.
Luton .	35	*Nil.*	6*d.*	No.	Month in Co.'s office.
Manchester	123	6*d.*	2*d.* per m'th.	Yes.	Fortnight in outside hall.
Newcastle ..	60	*Nil.*	1s.	Yes.	Month in Co.'s office.
Nottingham	80	*Nil.*	1s.	No.	Three weeks in outside hall
Nottingham Factory	216	*Nil.*	—	Yes.	Month in outside hall.
Oldham ..	35	1s.	3*d.* per m'th.	No.	„ „
Plymouth ..	25	*Nil.*	1s.	—	Fortnight in Co.'s office.
Sheffield ..	60	6*d.*	*Nil.*	—	Month in Co.'s office.
Swansea ..	51	*Nil.*	*Nil.*	—	„ „

SMART CONTRACT WORK AT BRIGHTON.

THE main body of the 4th Dragoon Guards reached Brighton at about six o'clock on Nov. 17 on their return from South Africa. By seven o'clock the same evening the Contract Manager had two £8 flat rate (residential) contracts before him for two of the officers of this famous regiment.

ROTTERDAM TELEPHONE EXCHANGE.

By W. M. FRANCE, *Engineer-in-Chief's Department.*

A FEW months ago I had the opportunity of visiting the Rotterdam Telephone Exchange to inspect a new central battery equipment recently installed there by Messrs. L. M. Ericsson, of Stockholm. As this differs very considerably from any equipment in use in this country, I think a short description of it and the method of operation may be of interest to the readers of this JOURNAL.

The town of Rotterdam is served by one exchange, and, therefore, there are no junctions, with the exception of those from the trunk exchange for connection with distant towns.

The exchange has an ultimate capacity for 18,000 lines, and is at present equipped for 8,000. There are 75 lead-covered dry-core cables, each containing 112 pairs, entering the building underground; all of these are armoured and laid in the ground without ducts.

At the rear of the building a cable shaft is provided to carry the cables to the apparatus-room floor, and on racks up the shaft each 112-pair cable is jointed to two 56-pair lead-covered dry-core cables, unarmoured. The latter after passing up the shaft are carried under a false floor in the apparatus room along the vertical side of the main frame. At the foot of each upright of the main frame one of the 56-pair cables is again jointed to two 28-pair silk and cotton cables, which are formed out and connected to fuses, heat

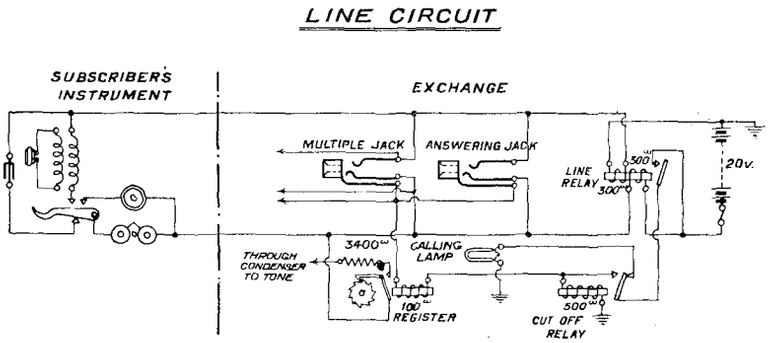


FIG. 1.

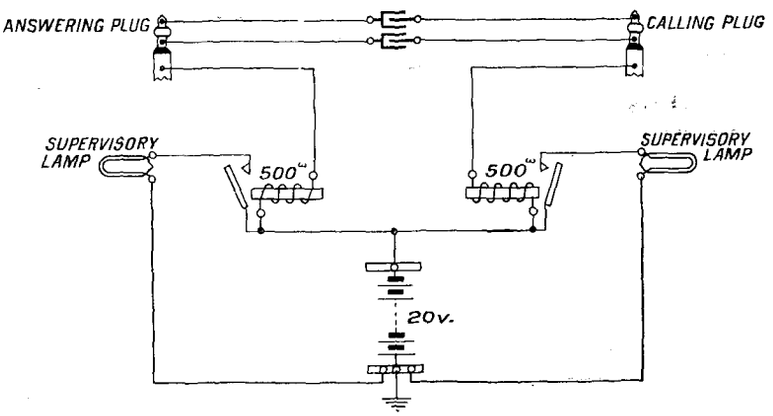


FIG. 2.

coils, and carbon arresters in the usual manner. The fuses are of the glass tube type, and have a carrying capacity of three amperes, and the heat coils are of the break type, similar to those used in the Company's magneto exchanges.

The main frame is of somewhat similar design to those used in the Company's central battery exchanges. The horizontal side is, however, equipped with test jacks instead of the usual connectors.

The power plant is located in the apparatus room and consists of two motor generator sets, each having an output of 350 amperes, and two ringing machines, all of Messrs. Siemens Schuckert's manufacture. The two motor generators and one ringing machine are driven from the town supply and the other ringing machine from the exchange battery.

There are two sets of cells installed, each having a capacity of 2,000 ampere hours at a ten-hour rate. These are located in the upper part of the building and are connected so that when one set is being charged the other set is supplying current for the operation of the switchboard. No arrangements appear to have been made for charging and discharging at the same time.

The leads between the cells and the power board consist of bare copper bars supported on insulators.

The switchboard is divided into two parts, the first consisting of eight distributing sections, upon which the subscriber's calling equipments are fitted, and the second part consisting of the multiple sections containing the complete subscriber's multiple.

The method of working is on the transfer principle, each call being handled by two operators, who will be termed hereafter distributing operators and multiple operators.

The duties of the distributing operators are to extend all subscribers' lines upon which calls are received to a non-busy multiple operator by means of transfer circuits, and the duties of the multiple operators are to ascertain the requirements of the subscribers and complete the connections.

Each distributing section is arranged for two operators' positions, and is equipped with 1,200 subscribers' calling signals and answering jacks.

Fig. 1 shows the connections of the subscribers' line and instrument circuit.

It should be noted that the line relay remains in circuit throughout the conversation, and the subscriber's transmitter is supplied with current through it from the central battery. The cut-off relay merely cuts off the calling lamp, and connects up the armature of the line relay to the bush of the jack through the register for the purpose of controlling the supervisory relay in connection with the cord circuit. A fuller description of the operation of this circuit is given later.

The multiple sections are each arranged for three operators' positions and equipped with a complete subscriber's multiple. At each multiple position there are eight groups of three single-cord transfer circuits connected (see Fig. 2), which terminate on single cords on each of the eight distributing sections. Each set of three cords on the latter sections is provided with a set of three lamps coloured white, green and red respectively, for the purpose of indicating busy multiple operators to the distributing operators. When a multiple operator is not busy the white lamps corresponding to this operator's cords, are lit on all the distributing sections. As soon as a distributing operator takes up one of the plugs from its seat the white lamps on all distributing sections go out, thereby indicating that this multiple operator cannot for the moment take care of any other call. If, however, another distributing operator, by mistake, takes up another plug belonging to the same multiple operator while the white lamps are out, the red lamp is lit, which is a further warning that this cord cannot be used. When the multiple operator throws her listening key to answer the call the corresponding green lamps in the distributing sections are lit, indicating that the operator will soon be free. When the multiple operator has thrown the ringing key, and thus completed the call, the white lamps in the distributing sections are lit again. In the event of the distributing operator finding all the white lamps out, a cord associated with one of the green lamps which may be alight may be used.

Before proceeding to describe the transfer circuit connections it would be as well to consider Fig. 2, which shows the principles of the Ericsson system as regards the operation of the supervisory signals and talking circuit. It will be noticed from Fig. 1 that when the subscriber calls, the line relay is energised, current from the battery flowing through one side of the line relay, the microphone and induction coil at the subscriber's office, and through the second winding of the line relay to earth. The operation of the line relay causes the calling lamp to light, and as soon as the answering plug (Fig. 2) is inserted into the answering jack

current flows from the battery through the supervisory relay *via* the bush of the jack, the 100-ohm register and 500-ohm cut-off relay to earth. The armature of the cut-off relay is attracted and cuts out of circuit the calling lamp and at the same time connects battery to the bush of the jack through the 100-ohm register. The object of the latter is to prevent the supervisory relay being energised through the earth on the cut-off relay. As soon as the subscriber returns the microphone to its rest the armature of the line relay falls away, and this in turn cuts the battery off the armature of the cut-off relay, thereby causing the supervisory relay to become energised through the earth on the 500-ohm relay and the supervisory lamp to glow.

The operation of the calling plug circuit is exactly the same as that of the answering plug.

(To be continued.)

A "WIRELESS" TELEPHONE OF 1844.

THE following paragraph entitled "The Telephone: A Telegraphic Alarum" is reprinted from the *Illustrated London News* of Aug. 24, 1844, and forms another early instance of the use of the word "telephone":—

THE TELEPHONE: A TELEGRAPHIC ALARUM.

Amongst the many valuable inventions recently laid before the Lords of the Admiralty, that of the "Telephone or Marine Alarum and Signal Trumpet," by Captain J. N. Taylor, R.N., is, perhaps, one of the most important; its objects being to convey sound signals to vessels at sea or in harbour; to transmit orders to and from forts and ships; to prevent collisions at sea, or on railroads; to transmit orders on the field of battle, from position to position, as an auxiliary to the duties of the aide-de-camp, or orderly, who frequently rides with important despatches in the face of an enemy in great haste and imminent risk; to inform engine stations in case of fire; for alarms in dockyards, etc.; and

as a means of communication between the palaces and halls of the nobility and gentry, etc.

The principle of the telephone is one of musical accord, composed of four alternate notes, given out separately, played like those of the cornet, and prolonged whilst the finger remains on the note. The instrument is formed of a chamber, into which air is compressed through three or more alternate pumps, which are moved by a corresponding number of cranks, set in motion by a winch; and of a set of piston keys, with valved apertures, giving free egress to the compressed air, which, in its passage, acts upon a series of metallic springs, and produces the required sounds through four pipes or trumpets.

The indicator or signal tell-tale, to be placed on the telephone drum, to denote the signals made, is composed of sixteen holes, in four parallel lines, and numbered at the top 1, 2, 3, 4. The first number made is to be indicated by a peg, placed under the required figure, in the first horizontal column, coloured red; the second number in the white; the third in the blue; and the fourth in the yellow line, observing that only one peg is to be placed in the same horizontal row of holes. The telephone gamut notes are arranged for numbers either by the public or private key. The alternate notes of the gamut C, E, G, C, being denoted by 1, 2, 3, 4.

The telephone No. 1, will convey signals four or five miles; and as a fleet sailing in three columns will not extend over more than three miles, it will be sufficient for the guidance of the whole fleet, in foggy weather, by night or day. For fixed stations, light-vessels, lighthouses, preventive ports, etc, it is made the size of a large drum, with trumpet in accordance, and will convey signals in foggy weather six or eight miles; or by unscrewing the trumpet, and applying a parabolic phonic reflector to it, the sound will be conveyed to a much greater distance.

ARMY TROOPS—ROYAL ENGINEERS.

BY A. K. WARD, *London Wall.*

THAT the Territorial Army scheme is not meeting with the success that it ought to, is, in the writer's opinion, largely due to the fact that people do not give the matter fair consideration. One's opinions are apt to be too hastily formed from the prejudiced statements of outsiders, and it is in the hope of causing some members of the Company to reconsider their opinions that this article is being written.

Many people object, not unnaturally, to signing on for a period of not less than four years; but it should be pointed out that this condition is made solely to prevent members joining as a mere pastime to be thrown over in a few months. On the other hand, those who are in earnest, may rest assured that any genuine reason given for withdrawing before the expiration of their time (such as leaving the country), will enable them to resign without any difficulty.

Another popular idea is that a large amount of one's time has to be devoted to drilling. In the army troops, Royal Engineers, the total number of drills required during the first year is 45, and as any number up to three can be put in at a single night's attendance, it will be seen that only fifteen attendances are absolutely necessary. In subsequent years, the number of drills required is fifteen.

Exceptional advantages are offered to telephone men in the Metropolitan area by the London telegraph companies, which consist of four units, namely—

London Airline Telegraph Company.
London Cable Telegraph Company.
London Wireless Telegraph Company.
London Balloon Company.

Members have the choice of joining any one of these units. The work consists mainly in the laying and maintaining of field telegraph communications.

Members are required to attend camp annually for a period of not less than eight days and not more than fifteen, during which time they receive pay at the army rate and also engineer's pay, which varies between 4*d.* and 1*s.* 8*d.* per diem, according to the technical knowledge of the member.

Week-end training and marches out are also arranged without any expense to members, but attendance at these is entirely optional.

There are no subscriptions in connection with the corps except by N.C.O.'s to the N.C.O.'s mess. Two uniforms are provided free, a khaki service dress and a blue dress suit.

Intending recruits and those wishing for further particulars should communicate in writing to me, National Telephone Company, Limited, 57, London Wall, E.C., when I shall be pleased to give any information required.

ANOTHER SWIMMING PERFORMANCE.

WE have to add another fine performance in swimming to that of Miss Armstrong, referred to in the JOURNAL of August last. Miss ASHBOLT, a member of the Southampton operating staff, has been successful in obtaining for herself the distinction of being declared the champion lady swimmer of Southampton, thereby being entitled to hold the "Ashbolt" cup for one year. At a meeting of the staff held on Nov. 9, the feat was referred to in a few well-chosen remarks by the District Manager (Mr. Howe), who was supported by the Local Manager (Mr. J. H. Gwyer). Mr. Howe personally acknowledged the performance by presenting Miss Ashbolt with a miniature cup. The achievement is all the more meritorious when it is considered that Miss Ashbolt is only sixteen years of age. Among the prizes she has already gained are twelve firsts, five seconds, and two thirds.

DISTRICT OFFICE ROUTINE AND ORGANISATION.

BY T. J. CLARK (*Chief Clerk, Manchester District*).

Continued from page 164.

No. 6 *Return.—Stores and Tools Statement.*—As will be seen from the diagram of the No. 6 (see Fig. 1), the receipts comprise stores on hand at the beginning of the month; the stores purchased through Head Office (per No. 6*a*), and through petty cash (as per No. 5); also the stores received from other districts the value of which is debited to us through the No. 6.

The issues represent the value of the nett quantity of stores issued during the month, and also the value of stores sent to other districts and in whose returns will appear corresponding credits to agree with our debits.

A separate statement is shown at the foot of the return giving the value of tools in stock, together with the amount of new purchases, and the amounts written off in respect of condemned tools.

The stores ledgers (which are now represented by cards in place of the old cumbersome books) are balanced quarterly, when the average prices are extracted and compared with the current buying price, so that any discrepancy may be adjusted in the subsequent entries. A space is provided at the top of the No. 6 for the entry of the ledger balance.

While at Bolton, some fourteen years ago, I tried the experiment of concentrating, in one set of ledgers, the various stock accounts for the whole district. This proved successful, and subsequently the system was adopted as a standard one by the Company and made compulsory in every district.

Stores are obtained from the storekeeper upon filling up a requisition slip, which must be signed both by the foreman and storekeeper. Stores slips should in all cases quote the number of the works order, and allocation, and great care should be exercised to quote correct information.

For recovered stores, the storekeeper makes out a credit slip which the foreman should sign at the time the items are handed in. All other stores received by the storekeeper are entered on credit slips, and the whole of these debit and credit slips are sent weekly to the district office where the stores' clerks price out the various items, on special stores sheets, and transfer the entries to the inwards and outwards books from whence the results are carried to the No. 6 return, and the details posted from the stores sheets to the ledger cards.

No stores slips should on any account be destroyed, but in the event of cancellation the cancelled slip should, in all cases, be handed to the storekeeper, and the counterfoil endorsed "Cancelled," it being part of the storekeeper's duty to see that all stores slips are accounted for and to report any case of omission.

The question of tools is a most important one, and members of the staff need to realise fully their responsibility for the safe custody and careful usage of all tools entrusted to their care, as the aggregate value reaches a very high figure.

I have now completed the circuit, so to speak, of what I regard as the most vital returns, though, necessarily in a somewhat abbreviated and condensed manner. There are many other returns, and matters connected with the clerical work entitled to attention, but time will only permit me to refer to a few.

No. 296 *Form.—Capital Expenditure.*—This gives the record each month of expenditure incurred on capital account (or new work) and shows the comparison with amounts sanctioned, in accordance with estimates previously submitted and authorised.

No. 149 *Form.—Revenue Expenditure.*—This gives the record each month of revenue, or maintenance expenditure, including the general working expenses, and as in the case of capital expenditure, the amounts expended are compared with the amount sanctioned by estimates previously submitted and authorised.

No. 10 *Return.—Uncompleted Estimates.*—This shows the expenditure incurred monthly in respect of very important works, representing large sums of expenditure, for which special estimates have been prepared and submitted prior to sanction being received from Head Office to proceed with the work.

Correspondence and Methods of Dealing with Papers.—The necessity for method and order in dealing with correspondence and papers generally is always a prime factor in securing commercial efficiency, and especially is this so in the conduct and administration of a large district which comprises the working of many important departments and, therefore, much division of labour.

The most perfect system in the world is of little or no avail unless the various sections of the staff loyally co-operate in carrying out the instructions laid down for their general guidance, so that the various units are blended into one harmonious whole, and the result is that smooth and efficient working which is the objective of all good management.

It is really surprising to notice the apparent callousness and indifference in dealing with papers on the part of some individuals, and I feel that I cannot lay too great a stress upon the serious responsibility which attaches to the heads of departments, and those directly concerned with the control and supervision of staff, for we all know the force and influence of a good example.

WORKS ORDER ROUTINE.

Contract.

Register.

Pink slip and extra white slip.	Green slip.
Engineer.	*Electrician.*
1. Receipt from D.O.	1. Receipt from D.O.
2. Separation of orders under heads of "N.C.," "R.C." and sundries "N." orders grouped under each ex.	2. Entry in W.O. index or local W.O. book classified under heads "N.C.," "R.C.," etc.
3. Separation of those W.O.'s not involving any engineer's work, such W.O.'s being at once returned to D.O.	3. Separation of orders not requiring engineer's work; those involving engineer's work to wait engineer's advice of completion.
4. Entry in local W.O. book or W.O. index.	4. Engineer's advice of completion.
5. Entry in record of outstanding W.O.	5. Advice to testroom for cross-connection on testboard and also intermediate distributing frame.
6. Assistant engineer.	6. Advice to I.D. for fault cards.
7. Wayleaves (private or railway).	7. Advice to ex. mgr. for exchange records.
8. Man hours estimate. Labour slate.	8. Distribution of work to fitting staff by chief fitter.
9. Pink slip given to foreman and white slip placed in cabinet against name of foreman.	9. Completion by fitter.
10. On completion of work pink slip returned by foreman to assistant engineer.	10. Advice to D.O. for charging of rentals, etc.
11. Advice to electrician for instrument fitting depart.	11. Advice to exchanges of new and ceased lines, removals and alterations for writing up interleaved directory.
12. Labour, stores and mileage entries checked.	12. Fitter's entries checked as regards time and materials.
13. Mark off W.O. index or local W.O. book and outstanding list of "N." orders.	13. Records of outstanding W.O.'s.
14. Spare wire and other mileage records.	14. Results incorporated in local departmental records.
15. Record of W.O.'s completed daily and grouped under classes.	15. Return of completed slip to D.O.
16. Filing of white slips in alphabetical order after completion.	
17. Return of completed slip to D.O.	

DISTRICT OFFICE.

1. Receipt of completed pink and green slips and entered W.O. register.
2. Entry in numerical register (actually entered when W.O. issued).
3. Entered rental register, measured, message or party line journals, private branch ex. records.
4. Entered returns No. 2 (rentals) and sub. charged.
5. ,, ,, ,, 2*a* (sales) ,, ,,
6. ,, ,, ,, 2*b* (removals) ,, ,,
7. ,, ,, ,, 2*c* (incomplete orders).
8. ,, ,, ,, 3 (new lines).
9. ,, ,, ,, 3*b* (ceased lines).
10. ,, directory.
11. ,, fee journal (P.O. and junction fees).
12. Cost slip and store slips attached to W.O.
13. W.O. finally examined and passed by cost clerk.
14. W.O. filed for audit and general reference.

FIG. 2.

Works Orders.—I now come to one of the most important features of the Company's whole business, for the works order is the link which binds together the records of all departments, and upon the accuracy of which so much depends. The diagram now submitted (Fig. 2) will give, I think, a fairly complete representation of the various stages of the works order's progress from the time it is issued to the date of completion.

The form of the works order has undergone many changes, and I may confess to some personal share in the suggestions submitted to head office for amendment.

Measured Rate Bookkeeping.—The measured rate is now a subject of such prominence that the next diagram (Fig. 3) showing the clerical processes in connection with the ticket records may be of some general interest. In connection with the message and measured service, the Manchester district office dealt with nearly 200,000 tickets for the month of December, and each month records a material increase in the number of measured rate calls dealt with.

MEASURED RATE BOOKKEEPING.

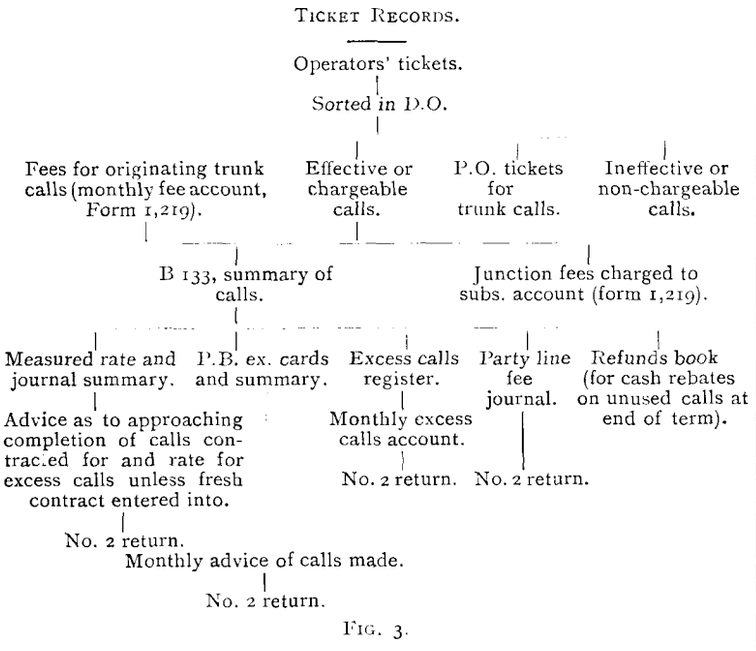

TICKET RECORDS.
Operators' tickets.
Sorted in D.O.
Fees for originating trunk calls (monthly fee account, Form 1,219).
Effective or chargeable calls.
P.O. tickets for trunk calls.
Ineffective or non-chargeable calls.
B 133, summary of calls.
Junction fees charged to subs. account (form 1,219).
Measured rate and journal summary.
P.B. ex. cards and summary.
Excess calls register.
Party line fee journal.
Refunds book (for cash rebates on unused calls at end of term).
Advice as to approaching completion of calls contracted for and rate for excess calls unless fresh contract entered into.
Monthly excess calls account.
No. 2 return.
No. 2 return.
No. 2 return.
Monthly advice of calls made.
No. 2 return.

FIG. 3.

Post Office Fees.—An immense volume of business is transacted in the Manchester district under this head. During the year 1907 the trunk fees and telegram charges reached a total of £38,300 and represented 1,614,000 tickets or individual postings to the subscribers' accounts.

Cost Clerk's Department.—The importance of this department may be gauged from the fact that in the January, 1908, issue of the TELEPHONE JOURNAL there is an article by Mr. Hare entirely devoted to the cost clerk and his duties. In these days the cost clerk may be said to live in an atmosphere of statistics and to thread his daily path through an endless succession of curves and calculations. The value, however, of these analytical figures for estimate and comparative purposes has been amply demonstrated.

Wayleaves.—These may be said to constitute one of the most serious and difficult problems connected with the Company's business. We have so many different authorities to contend with, so many exacting demands to meet, that the whole matter becomes one of great complexity and frequently of anxiety.

Wayleave agreements require to be numbered for filing purposes and entered in the wayleave registers specially provided, which, for ordinary wayleaves, are so divided as to concentrate the due dates for the entries under the respective months of the year.

Each of these entries requires to be indexed in a twofold sense, (1) in the name of the grantor and (2) in the name of locality to afford ready reference.

As many thousand entries are involved in a large district the clerical work in connection therewith (and which includes many special forms and returns) is obviously considerable.

The Human Side or Psychological Aspect.—And now I should like to be allowed some reference to the worker as distinct from the mere routine of staff duties. The importance of establishing cordial relations among the staff can hardly be overstated and the value of good "team" work, which has been pointed out in other papers read before this society, applies with equal force to the clerical staff. It should be the constant aim of all members of the staff to cultivate a keen interest in their work and to acquire the virtue of thoroughness. We should always remember that we owe it to our self-respect to give of our very best, and no consideration should be allowed to divert us from this simple and elementary duty. The man who, possibly under some sense of disappointment, thinks to adjust matters by depreciating the quality and output of his work commits a fatal error and places himself hopelessly out of court. And since we do not live for work alone the question of relaxation or change of occupation is a very natural and legitimate one, and especially as helping to realise that ideal combination of a sound mind in a sound body which may be summed up in two words—good health. Many hobbies, such as literature, music, photography and the study of languages, form a wholesome and welcome change to one's ordinary daily toil, and have the valuable effect of furnishing a common bond outside business interests for linking up those of kindred tastes and temperament in a manner which can hardly fail to react beneficially upon our business relations, as, after all, human nature is very susceptible to social and sociable influences.

TELEPHONE EXCHANGE AT THE ELECTRICAL EXHIBITION, MANCHESTER, OCTOBER, 1908.

THE National Telephone Company had at the Exhibition a switchboard of the standard common battery type, equipped for two operator's positions, 100 extension lines and 40 junctions, to the Manchester Central Exchange. There were fifteen connecting cord circuits per position, each provided with two supervisory signals. Current was supplied by a battery of eleven accumulators charged over special power leads from the main exchange.

An excellent service was maintained and the subscribers freely expressed their entire satisfaction with it. It was gratifying to note that the exchange proved to be one of the most attractive features of the exhibition, the crowds at the windows during the busiest hours becoming quite formidable, and although they were to some extent composed of the merely curious there was a considerable element of the seriously interested. A large quantity of the Company's advertising matter was distributed, and the advantages of the service brought to the personal notice of a considerable number of visitors.

Contact with these crowds of people brought one lesson forcibly home to a telephone man, that was, the fact that there still exist, even at this enlightened stage of the work, so many thousands of people who have not the faintest idea of what a telephone is. The looks of amazement and even incredulity on the faces of many who listened to the explanations of what was going on gave rise to mingled feelings in one's breast and convinced one, if there had been any doubt whatever, that there is indeed an enormous scope for the development of the telephone service in this country.

GLASGOW LORD PROVOST'S UNEMPLOYED FUND.

IN view of the very general and acute distress prevailing in Glasgow and district at the present time owing to the lack of employment, the Lord Provost opened a fund to provide relief for necessitous cases. The Glasgow members of the Company's staff have agreed to contribute weekly to this fund till the end of December, and as a result of the first month's contributions the following amounts were forwarded to the treasurers of the funds named:—

Glasgow	£23 0 0
Govan	2 10 0
Partick	2 0 0
Total	£27 10 0

THE TELEPHONING OF BOURNEMOUTH.

BY E. HARPER, *Local Manager, Bournemouth.*

MUCH has been written in the JOURNAL from time to time by various writers on the telephoning of residential areas as it affects the Engineering, Traffic and Contract Departments; and, as the development and provision of a satisfactory telephone service in a high-class residential area offers problems in some cases very different from those met with in a commercial area, it occurred to the writer that a study of the actual conditions existing in such an area might be worthy of a little space in these columns.

The telephone system of Bournemouth, as discussed in the following remarks, may not perhaps be considered the "last word" on the subject by the up-to-date telephone engineer, consisting, as it does, of a magneto local battery system with mixed indicator and lamp calling at the exchange. Current for working the exchange is obtained from the public supply mains, an alternating current of 200 volts being transferred to 55 volts and rectified by means of a "Nodon valve" to charge two sets of chloride accumulators.

The principal feature, however, is an elaborately distributed system of underground cables.

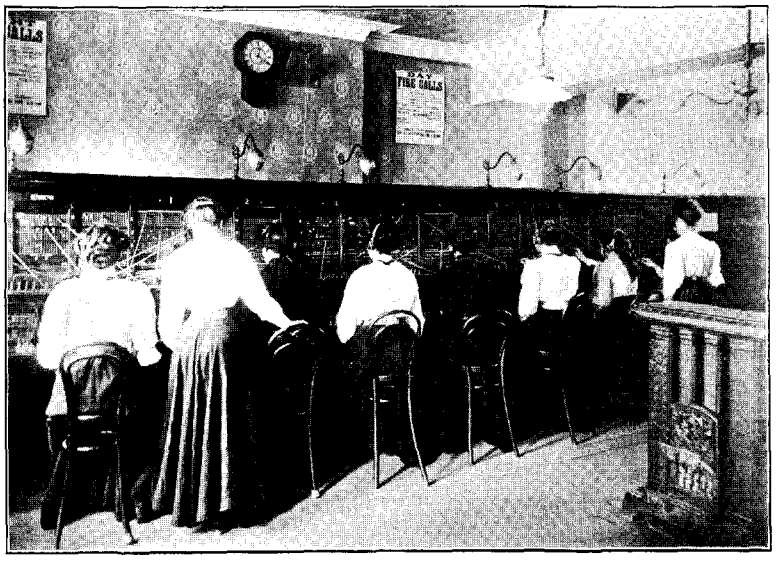


FIG. 1A.—BOURNEMOUTH SWITCHROOM.

Bournemouth is a town of 70,800 inhabitants, and boasts of being the premier "garden city" in the country. The boast can be fully justified, for there is scarcely a house, down to the humblest cottage, that is not detached or semi-detached, and stands in its own garden. Being entirely a modern town, slums are non-existent, and throughout the borough the grounds surrounding the houses are thickly planted with trees, which makes the provision of overhead circuits a difficult matter.

Before discussing the underground distribution it might be well to give some figures showing the development of the exchange service up to date. The exchange lines in the borough number 1,550, and exchange stations 1,950, the figures for the area being 2,000 and 2,550. The increase of stations has been at the rate of 206 and 298 per annum respectively during the past four years.

An electrophone service is provided to the Winter Gardens, theatre, and the leading Church of England and Nonconformist places of worship which is becoming increasingly popular with the residents. The possibilities of this service in such a town as Bournemouth are practically unlimited.

There are in the borough 14,000 dwelling houses, of which approximately 50 per cent. will be assessed at £40 per annum and upwards, which, as rents are high in the town, may be considered a reasonable average minimum of the houses subscribing to the telephone service, and of these approximately 1,700 are now connected, equalling 12 per cent.

Analysing the subscribers in the borough, and putting the residences (including boarding houses and hotels) against the trades and professional connections, there are—

Residences... ...	440	Doctors	81
		Dentists...	19
Boarding houses,		Grocers	64
etc.	143	Bakers	50
		Ironmongers	25
		Fruiterers	56
		Fish and game dealers ...	89
		Drapers and outfitters ...	46
		Stationers	34
		Estate agents	94
		Builders and decorators	91
		Jobmasters	39
		Miscellaneous	243
Total	583	Total	1,031

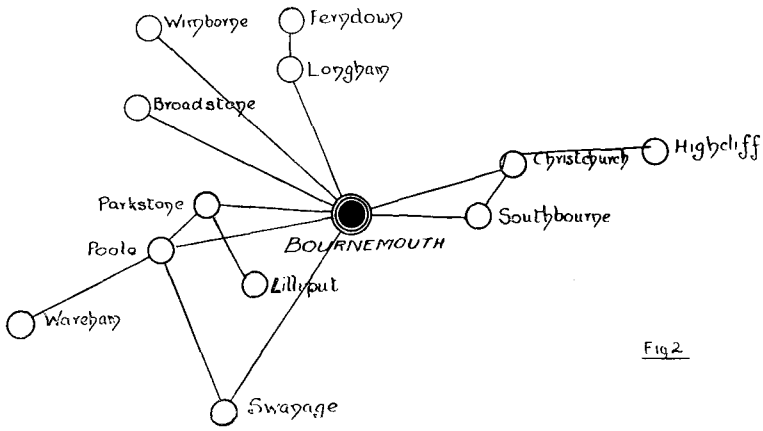
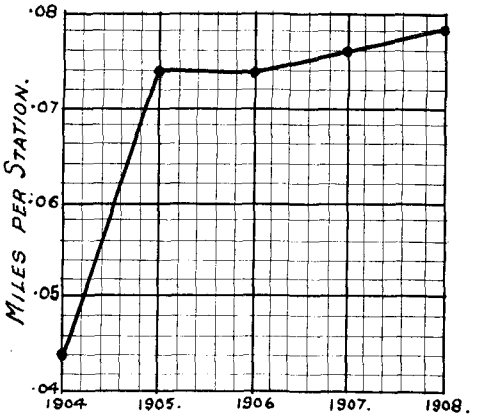


FIG 2

In considering the number of private houses connected, account must be taken of the fact that the bulk of the tradespeople live on their premises, and as service is available for both business and domestic purposes, from the point of view of originating calls, these may be taken as private houses.

For many years previous to 1905 the system only included the borough of Bournemouth, Poole and Christchurch. In 1905 the Swanage and Wimborne Exchanges were opened, Broadstone and Wareham in 1906, and Longham, Ferndown, Lilliput, Highcliffe, and Southbourne this year; making now thirteen exchanges, covering 80½ square miles, an increase of nine exchanges and 39 square miles in three and a half years. The population in this area cannot, of course, be compared to that of a thickly populated manufacturing one, but the extent of the area will compare favourably with many other residental areas, and this has a considerable influence on the general development. The increase in junction mileage, viz., $\frac{\text{mileage}}{\text{stations}}$ is shown in curve form.



In connection with the development figures it may be mentioned that a Contract Department was opened in August, 1906, and universal measured rates were introduced on Jan. 1, 1907.

The traffic at such an exchange may be naturally subdivided broadly under two heads, viz., social calls, and calls to tradespeople, and in order to get some figures indicating how much the "shopping by telephone' idea has developed I had a record taken of a number of typical residences a short time ago, and found that 65 per cent. of the calls were to tradespeople, which on the basis of the daily traffic averages 8·6 per day to each of the above-mentioned tradespeople

and as the bulk of the calls meant an order the value of the telephone service for shopping purposes is again emphasised.

The provision of a satisfactory *and economical* outside plant to meet the requirements not only of the service, but of the æsthetic ideas of the residents and governing body, is a matter of considerable difficulty.

The photograph (Fig. 3) will perhaps give some idea of the character of the place. This is a road near the centre of the town, and although practically no houses can be seen in the photograph, they exist on both sides of the road, the grounds in every case abutting on the next one, and 64 per cent. of them are connected with the telephone service.

The underground system was laid down in 1900, and has, of course, been considerably extended from time to time to provide for new connections. It now consists of 35 miles of cables, ranging from 500-pair to two-pair, and containing over 2,600 miles of circuit.

The extent to which it has been found necessary to distribute the cables to meet the local conditions will be seen from the number and size of the opening points. There are 293 of these, ranging in size from 52-pair to one-pair, and of these there are 111 of two-pair capacity, ten of three-pair, and 51 of five-pair.

With underground distribution carried to this extent it follows that if the circuits in the main cables are to be economically used,

FIG. 3.—A TYPICAL BOURNEMOUTH ROAD.

teeing of the branch circuits must be carried out very largely to obtain the necessary elasticity, and out of the 2,400-pairs entering the exchange, 17 per cent. are teed to two points, 5 per cent. to three, 1·5 per cent. to four and ·5 per cent. to five points.

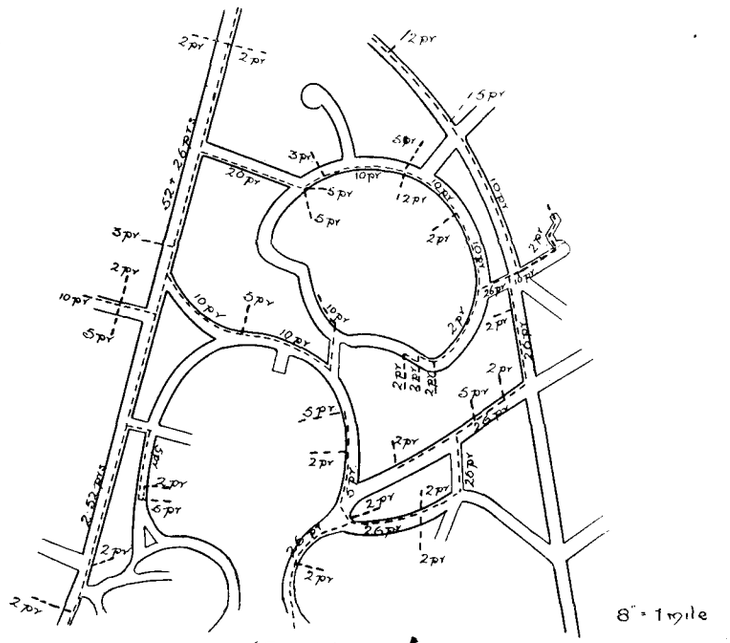
Although there is a comparatively large number of five-pair opening-out points, this is not found to be an ideal size owing to the difficulty experienced in getting permission from the owners or tenants to distribute the remaining four wires from attachments on the premises. A two-pair cable only leaves one pair for distribution and does not, in many cases, enable full advantage to be taken of the wayleave.

A three-pair cable seems from experience to strike the happy medium, as this provides for the house on each side of the centre one to which the cable is run, and no great difficulty is usually experienced in getting permission for two brackets in these cases. This size cable is now being used in preference to two-pair, where circumstances do not permit of a larger size being installed.

To illustrate further the extent to which it has been necessary to distribute underground in the principal residential areas, the appended diagram (Fig. 4) may be taken as typical, representing an actual case in the centre of the town.

With any system of teed circuits the accurate numbering out and labelling of the leads at the pot-head is a most important matter, and in the writer's opinion the method of terminating the cables on pot-heads is open to many objections on such a system, owing to the danger of interference with the working circuits.

The early adoption of cable terminals in lieu of pot-heads as foreshadowed in the new issue of "Instructions to Foreman and Lineman" is to be welcomed on this account, as the teed and spare circuits will then be properly terminated and insulated, instead of being taped down the side of the pole, and there will be no danger of confusion owing to the tallies being lost by gangs in picking up leads.



(FIG 4) UG cables shewn thus - - - -

The wayleave difficulties met with in such a high-class residential town are, of course, many and various. One recent case may be recalled as a good illustration of the extraordinary ideas held by some people of the value of these wayleaves. It was necessary to erect a route to carry about three circuits across a road, along each side of which were some small villas. The wayleave for the crossing was definitely refused at all points except one, where there seemed

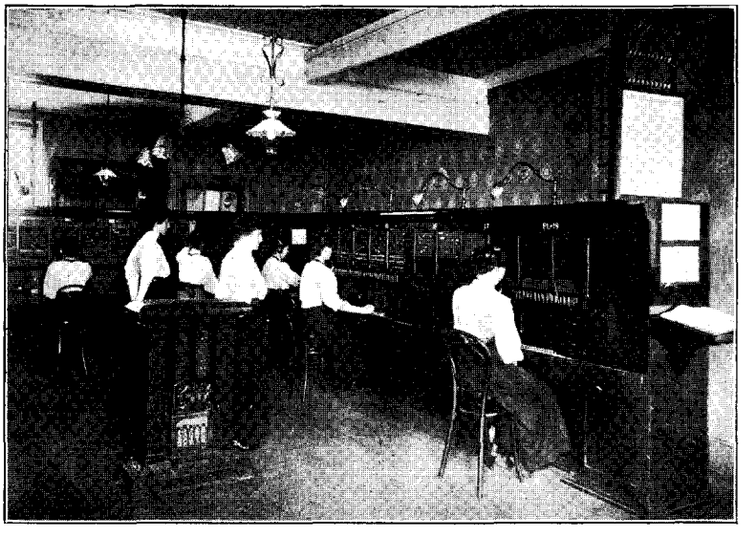


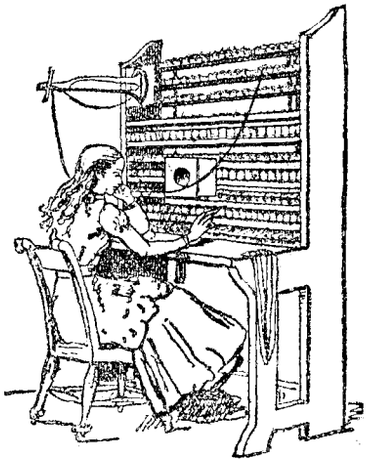
FIG. 5.—A CORNER OF BOURNEMOUTH SWITCHROOM.

to be a possibility of securing it. It had, however, at last to be abandoned, because the only condition on which it could be obtained was that the Company *should buy the house*. The owner considered this a perfectly reasonable offer, and could not see the difference between a railway company purchasing the land over which it was proposed to build a railway, and the telephone company crossing overhead with a few inconspicuous wires.

TELEPHONE WOMEN.

XXIX.—ANNIE RAMSAY MARTIN.

MISS MARTIN entered the Company's service as a junior operator in Dundee Central Exchange as far back as July 30, 1882. At that time there were about only 150 subscribers on the exchange.



The switchboards were of the upright slipper jack type with Blake transmitter and the receiver of the original single pole pattern. The Mann call-wire system had been just introduced, necessitating continuous listening, and the holding of the heavy receiver constantly to the ear was very trying. To obviate this a brass arm, as seen in the picture, was used, the receiver being suspended to this, but the holder could only be used at quiet times as it kept the mouth too far from the fixed transmitter and the ear had to be taken away when the operator was putting through the calls. Then the battery switch had to be operated by the feet and gave much trouble. For some time after Miss Martin joined the service strong competition was being carried on with a local company and large numbers of lines were being added daily to the exchange. To meet the pressure, a sub-exchange was opened in the west-end of the city in 1885 with Miss Martin

MISS ANNIE RAMSAY MARTIN.

in charge. In August, 1886, when the position of Clerk-in-Charge of the Central Exchange became vacant, Miss Martin was promoted to fill it, since which time she has successfully performed the duties of this office. Referring to this competition in Dundee, the *Postal Telegraphic and Telephonic Gazette* of that time states that the "National Company offer the public a decided advantage in the shape of a very rapid system," and the *St. James's Gazette* gives the time taken to put two subscribers into communication with each other at twenty seconds. As Chief Operator, Miss Martin has had the satisfaction of seeing the number of subscribers' lines on the exchange increasing to close on 2,000 and the staff under her to 35. Miss Martin is of a quiet and unassuming manner, and possesses the esteem and confidence of the staff in every department in the district. She takes a hearty interest in all the recreative movements of the staff, and is invariably to the front in promoting the success of all their social gatherings.

XXX.—JANE TRUBSHAW.

MISS JANE TRUBSHAW, Clerk-in-Charge of the Middlesbrough Central Exchange, joined the service under the Northern District Telephone Company in September, 1892. The board in use at that time was fitted with large slipper jacks, suspended Blake transmitters and hand receivers. Trunk line communication was only available to Newcastle, Sunderland, West Hartlepool, Darlington and Durham. In 1895 an up-to-date switchboard was fitted and the introduction of breastplate transmitters, etc., facilitated

MISS JANE TRUBSHAW.

the operating to a great extent and effected a considerable improvement in the service. Miss Trubshaw was appointed Clerk-in-Charge in October, 1899. Since that date many new exchanges have been opened in the area and the number of subscribers has also increased rapidly.

The courtesy and tact displayed by Miss Trubshaw in connection with her duties is frequently commented upon by subscribers, with whom she is very popular, and the staff under her control are likewise enthusiastic in their praise of her qualities. Miss Trubshaw has no particular hobby, but is very fond of outdoor exercise, it being quite an ordinary event for her to walk a distance of twenty miles. She also takes an intelligent interest in all social gatherings arranged by the staff. The appointment of Miss Trubshaw as Operator at the Middlesbrough Exchange was arranged in 1892 by Mr. C. B. Clay, now Metropolitan Superintendent, and she has since served under two district managers and four local managers.

A POPULAR VIEW OF THE ELECTRON THEORY.

BY J. R. MILNES, *Engineer-in-Chief's Department.*

(*Continued from page* 169.)

III.

THE re-statement of the laws regarding "static" electricity enables us to proceed to a more detailed consideration of what takes place when a current flows, and to point out the actual relationships between the so-called "static" and current electricity.

Electro-Chemical Action.—When two metals, say, zinc and copper are brought into contact both metals become charged, the copper negatively and the zinc positively. This fact, first observed by Volta, has led to the arrangement of the metals in a definite series, ranging from the more electro-positive aluminium to electro-negative platinum.

The result may be re-stated by saying in the above case that copper, on account of its positive position in the series, exerts a greater attraction upon electrons than zinc. There is then an inherent difference of potential between them, only coming into action when they are brought into contact, and resulting in the flow of electrons from zinc to copper.

If zinc is placed in a dilute solution of zinc chloride there is a great tendency for the zinc atoms to pass into the liquid as positive ions, but this is prevented by the inability of the zinc to get rid of its superfluous electrons. When, however, a platinum plate and a zinc plate connected together are immersed in a solution, say, of hydrochloric acid, *capable of entering into chemical combination with the more electro-positive of the two elements* a different state of affairs arises. Here the metal is capable of entering into solution, and a small quantity dissolved in the liquid loses electrons in order to form hydrated ions and the electrons become attached to the zinc plate, charging it negatively. That is to say, zinc atoms are constantly going into solution and giving up their electrons to the zinc from which they issue. But these electrons can pass round the external circuit, and on arriving at the copper neutralise the positively charged hydrogen atoms, enable them to free themselves from the water molecules and escape as hydrogen gas.

From this it follows that to enable the formation of zinc chloride to take place it is necessary for the zinc to constantly lose the negative charge due to the initial combination. Similarly, to enable the hydrogen gas to become dehydrated it must have a supply of electrons to neutralise the positive charge in the hydrogen atoms. Both these conditions are fulfilled by joining the pieces of platinum and zinc together, and the result is an ordinary voltaic battery.

It will be as well here in order to obtain a coherent idea of the subject, at the risk of the charge of diffuseness, to digress for a moment and glance briefly at the existing theories of electrolysis.

It is a well-known fact that when an electro-motive force of sufficient potential is applied to a liquid the liquid becomes decomposed into its constituent parts. That is to say, if the wires from a suitable battery are introduced into a glass of acidulated water the water is split up into the elements of which it is composed—hydrogen and oxygen. Grotthuss formulated a theory to account for the flow of current in a solution and to explain the decomposition. He assumed that the molecules of the liquid, beforehand with no definite structure, arranged themselves in chains between the negative and positive poles of the battery, dipping into the solution so that the more electro-positive element in the compound pointed towards the electro-negative pole, and the more electro-negative pointed towards the electro-positive pole as shown in Fig. 1. When the potential existing between the two metals, or applied externally, was sufficiently high, that is to say, enough to overcome the force holding the atoms together as a compound, the negative element was liberated at the positive pole and *vice versa*, simultaneous interchange of atoms taking place all along the chain.

To state more amply what has previously been said, all the elements may be arranged in the order of their electro-negativeness to hydrogen, one of the most electro-positive elements known.

This amounts to the fact that there is a difference of potential existing between any two elements, which under suitable circumstances may give rise to electric current, and often at the same time chemical action. This general principle underlies the theory of both chemical action and all forms of electric batteries. Probably no chemical action or combination of two elements can take place without there being an actual difference in their atomic electrical states. Certainly no electrical action can take place between two pieces of the same substance placed in an electrotyte, *but*, if two metals having a definite difference between their electrical properties, such as copper and zinc, be placed in a suitable solution and connected together chemical action, together with a flow of electricity, will be the result.

Both the action in a voltaic cell and the action of a battery of cells acting externally on a solution come under the heading of electrolysis.

A theory which has aided considerably in the comprehension of the state of affairs in an electrolyte is that of the dissociation of compounds when in an aqueous solution.

In all dilute solutions in water it is supposed by many chemists that a large portion of the substance dissolved becomes to a more or less extent dissociated, that is to say, split up into its component parts, and this is often more capable of being acted upon both chemically and electrically than would be the case with the substance if it were not in solution. Practical results have led to a confirmation of this theory in its general outlines, though there are several differences of opinion with regard to the actual molecular arrangement of the atoms of a body in solution, which need not be entered into here.

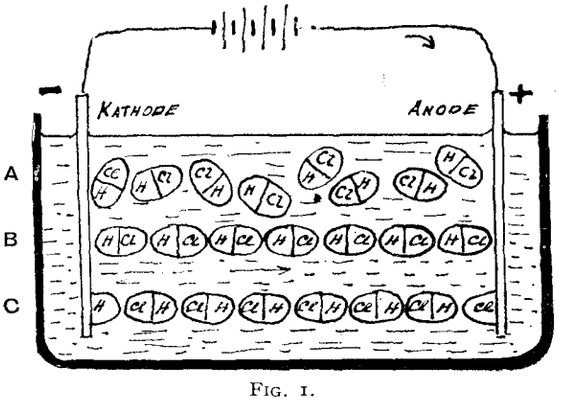


FIG. 1.

A = molecules of hydrochloric acid before E.M.F. applied.
B = molecules of hydrochloric acid at moment before current passes.
C = molecules of hydrochloric acid after current has passed and hydrogen atom has been liberated at cathode and chlorine atom at negative.

If the battery is taken out and a copper plate substituted at the kathode and a zinc plate at the anode, the diagram corresponds to a simple cell; the chlorine then combining with zinc to form zinc chlorine.

It will at once be seen that, owing to this splitting up of the molecules due to the solution, a much smaller electro-motive force is required to complete the decomposition, and this is borne out in practice.

Of yet greater importance is the modification which may now be made to Grotthuss' original theory. Owing to this state of dissociation of the body in solution, what probably occurs in the electrolyte is the formation of two streams of ions flowing one towards the negative pole and the other towards the positive.

To gain an idea of the remarkable power of dissociating or ionising compounds possessed by water, it has been stated that if water contains only ·0036 per cent. of hydrochloric acid, 99 per cent. of all the acid molecules will be split up into hydrogen and chlorine. Pure water, it should be stated here, has very few ions or dissociated molecules, and is therefore an almost perfect insulator; its power of ionising bodies in solution accounts for nearly all its conducting powers.

The mobility of the hydrogen and chlorine ions in the water is, however, extremely small compared with the electron, it being probable that they are bound up with a large number of neutral water molecules which retard their action, the result being that they

move extremely slowly, accounting for the relatively poor conducting powers of solutions.

Having rubbed up our acquaintance with the familiar theories of electrolysis, we may now proceed to apply the principles of the electron theory to an electrolytic circuit.

On the hydrogen or positive ions arriving at the negative plate, they meet a vast number of electrons ready to pass out of the metal at the slightest provocation. Such provocation is supplied by the hydrogen ions, which, owing to their having been combined with a chlorine atom have each lost an electron, and are positively charged, and draw electrons from the metal. The hydrogen, having now acquired an electron the deficiency in which bound it to the chlorine atom, is at liberty to escape from the neutral water molecules as a free gas in the form of bubbles.

At the anode or positive plate the reverse process is taking place. The chlorine atoms, with an electron to spare, pass these on to the positive plate, and are now also free to escape as chlorine gas.

It will be remembered that the valency of an element is given by the largest number of hydrogen atoms which will combine with an atom of the element, or, in cases where combination with hydrogen is impossible, with some other monovalent element. Thus chlorine is monovalent, that is to say, one atom of chlorine will combine with one atom of hydrogen to form hydrochloric acid, or hydrogen chloride as it may be called. Zinc, on the other hand, is divalent, two atoms of the monovalent element chlorine combining with one atom of zinc to form zinc chloride.

It is well to recognise that although an element may be satisfied with combination with a certain other element, such as one atom of hydrogen with one atom of chlorine, there is nothing to prove that it is saturated and has no remaining affinity left. As Newth puts it, hydrogen may be capable of combining with one and a half atoms of chlorine, but as the chlorine atom cannot be split and hydrogen cannot combine with two atoms of chlorine, there is still retained a residual combining capacity. This will account for the double salts, and is of some significance as will appear later on in connection with the electron theory.

Now, as stated in the introduction, there is a definite relationship between the valency of an element and its detachable electrons. The atomic volume (that is, the space occupied by an atom of an element, including its sphere of influence) is proportional to the number of its detachable electrons. In other words, the valency of an element may be taken as equivalent to the number of detachable electrons. Thus a monad has one and a triad three detachable electrons. It must not be forgotten that in the classification of elements in Mendelejeff's tables there are eight groups and, theoretically, elements possessing the power of combining with seven and eight atoms of a monovalent element should exist. Compounds are only known, however, equivalent to hexavalent elements, and therefore the question as to the existence of seven and eight detachable electrons in the seventh and eighth groups is at present undecided, these groups behaving as monads in many cases.

If we once more return to the consideration of a simple primary battery consisting of a plate of platinum and a plate of zinc immersed in dilute hydrochloric acid, it will be noticed that the chemical reaction taking place may set down as follows:—

$$Zn + 2\,HCl = ZnCl_2 + H_2$$

That is to say, two atoms of chlorine are required to unite with one atom of Zn, and as a result, two molecules of hydrochloric acid have to be split up and two atoms of hydrogen liberated. Zinc being a divalent element and having two electrons set free by the combination with the chlorine is thus enabled to supply the two electrons necessary for the existence of the two normal hydrogen atoms, one electron going to each atom.

From the foregoing the following rules may be deduced:—(1) That the position of metals in the voltaic series is entirely due to the relative ease with which they part with their electrons. (2) The more electro-positive elements part more easily with their electrons. (3) Insulators, evincing as they do contact electricity of similar sign to frictional, may be included in a continuation of the same series, thus (4) Frictional electricity is simply a form of voltaic electricity. (5) The valency of an element denotes the number of detachable electrons contained in any normal atom of that element.

(To be continued.)

STANDARDISATION: THE PUBLIC TELEPHONE SIGN.

By F. GILL.

If there are any telephone administrations who have not yet definitely adopted a public telephone sign, and if such administrations are reached by the NATIONAL TELEPHONE JOURNAL, I would ask them to consider the question of adopting an international sign which should stand for a public pay station or call office all over the world. So long as the sign is a good one, and thoroughly serves its functions, there can be no objection, except the trivial one of sentiment, to adopting a sign already in use and known, and surely in a time when travel is common it is worth while to secure unity on such a matter. Telephone service means intercommunication, and we know what an aid it is to the service to have uniform equipment and methods; it is just the same with the public telephone sign. People from another town or country can readily recognise an international sign even if they cannot read the language, and thus, while the public is better served, the telephone authority reaps a larger reward. But besides this what earthly purpose is served by every administration having a different sign, except perhaps it gratifies a useless artistic vanity in the design of one to eclipse that of some one else. The only case in which I can see any possible reason for not adopting a standard sign is when there is opposition between two administrations, as for example in some towns in the United States. I do not mention the British Post Office in this connection, since, as in three years the whole system in this country will belong to that department, it would be unlikely to adopt such a course as would hamper it later on.

If then we accept the statement that there are strong reasons why there should be a standard sign, the question is what shall it be? The answer is ready to hand. When recently the National Telephone Company had this matter under consideration it reviewed many designs, but did not find any better sign all-round than the Blue Bell used by the American Bell Telephone Companies, and the National Telephone Company was strong enough to put aside foolish sentiment (I can say this since I was not responsible) and adopt a thoroughly good thing, thus making one step towards an international sign.

Among the requirements of a good sign are that the recognition should be of a design rather than of any words, that it should be recognisable from a distance, that it should not be a repetition of a design commonly used, or of one likely to be common in the future. All these the Blue Bell has in a special degree.

There are in the United States many thousands of public pay stations and in the United Kingdom there are about 9,000. All these either have, or will have, the Bell sign and there is therefore a good ground from which to start.

I think there is another reason why telephone men (engineers, at any rate) should urge the adoption of the Bell sign. The sign obviously is a play upon the name of the inventor of the telephone, Alexander Graham Bell; every sign therefore which shows the Bell is a monument to the man who gave to the world this invention of surpassing utility; it is obvious, of course, that this significance requires translation into the English language, but that also is as it should be, for was not Bell a native of the United Kingdom. Let telephone men therefore be united in this, and let all who can do what in them lies to raise a memorial to Bell throughout the whole world.

AUTOMATIC BOX THEFT.

An attempt was made on the afternoon of Oct. 30 to break open a money box in one of the Company's call offices in Central Station, Glasgow. A bell connected with the box, and fixed in a cab office near by, promptly sounded the alarm, with the result that the man was captured by the cab office attendant. The would-be thief, when brought before the Glasgow Sheriff Criminal Court, admitted the charge, stating that it was done on the impulse of the moment. The accused, however, had a very serviceable jemmy and a pair of pliers in his possession when caught. Sheriff Balfour pointed out that the accused had already suffered fifteen months' hard labour, and then passed sentence of nine months' imprisonment.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
TELEPHONE HOUSE, VICTORIA EMBANKMENT LONDON, E.C.

NOTICES.

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The Editor will not undertake to be responsible for any rejected MS. All photographs will be returned if the sender desires.

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VOL. III.] DECEMBER, 1908. [No. 33.

THE "JOURNAL" AND THE STAFF TRANSFER ASSOCIATION.

SINCE the terms of the Agreement of February, 1905, for the sale of the National Telephone Company's undertaking to the Post Office were first made known, the unsettled outlook for the future of the staff has undergone a material and satisfactory change. For this improved prospect the unremitting efforts of the Staff Transfer Association are responsible, and it need hardly be said that the whole-hearted sympathy of the Editing Committee of this JOURNAL is with the Association, nor need we iterate our desire to assist it in every possible way in its endeavours to further the interests of the staff. Editorial comment on a matter so nearly touching their welfare, and more frequent reports of Association news, would have appeared in our columns but for two reasons. One is that a monthly publication is not always a suitable vehicle for circulating news perhaps already circulated by the Association some weeks before the date of publication of the JOURNAL, and the other is that it is often inadvisable to comment publicly on matters which are still *sub judice*. It must not be forgotten that the JOURNAL reaches a field far wider than the circle of the staff, and whilst the stages of difficult negotiations may at times very properly be reported to the latter they could obviously not be made known to the world at large. Editorial reference to questions still under discussion are embarrassing to both sides, and serve no purpose but to make negotiation more difficult and prejudice the issues at stake.

It is well known that much yet remains to be accomplished by the Association, who at all times may count upon our support in their arduous task. We are of opinion that their constitutional, judicious, and yet vigorous agitation has been and is on the right lines to secure the sympathy of Parliament and the public, and to attain their ends. We heartily wish them every success in their future negotiations.

THE CONSTRUCTION STAFF.

WITH reference to the recent discharges of certain of the construction staff, and the possible dismissal of some thousands more, the Postmaster-General made the following statement in the House of Commons on Oct. 26:—

Applications for employment in the Post Office from men discharged by the company were being met so far as work could be found, and 105 men had been engaged during the last six months. Arrangements between the Post Office and the Company were under consideration which would, he hoped, enable such works of construction as might be required for the service after 1911 to be continued uninterruptedly.

Seven days later the Principal Secretary of the Staff Transfer Association issued the following circular to the members of that body:—

On Oct. 26 the Executive Committee learning that active negotiations were taking place between the Postmaster-General and the Company, waited on the President and pointed out the serious position created by the discharges of staff which were still going on. It was pointed out that if the negotiations were successful, the whole of the staff would be required by the Company, and the President was asked to stop the dismissals pending the result of the negotiations. Mr. Franklin gave a sympathetic hearing to the representations made on behalf of the staff, and promised to consider the matter.

The Central Committee now have pleasure in announcing that Mr. Franklin has given instructions for works to be pushed on out of the ordinary course, so that as far as possible the whole of the permanent staff can be employed, and further dismissals avoided during the winter months.

The Central Committee trust that in the meantime some arrangement will be come to to enable the telephone business to be carried on on ordinary lines, and will take all possible steps to procure this result.

We believe that it was with extreme reluctance that the Company found itself compelled, in view of the impending cessation of construction work, to dispense with the services of men for whom they could find no work, and who in many cases have long been members of the staff, and that they acceded with great willingness to the suggestion of the Staff Transfer Association that pending the negotiations referred to every endeavour should be made to obviate discharges of staff.

TELEPHONE DICTION.

MR. STEPHEN COLERIDGE is reported to have said at Birmingham recently: "Men do not cultivate a better style in writing through the advent of the sixpenny telegram and the halfpenny postcard, nor a purer diction by talking down a telephone." If he merely means to say that the telegram, the postcard, the telephone message have engendered, in conjunction with the numerous other time-saving devices born of steam and electricity, a more feverish habit of life, that we live in less leisurely times than our forefathers, that we are less deliberate, less ceremonious, he is possibly correct, although we are strongly inclined to doubt whether our ancestors habitually luxuriated in those rotund and rolling periods which modern critics sometimes affect to regret, or whether only certain of them did on certain occasions. But Mr. COLERIDGE goes further than this; he states specifically that a purer diction is not cultivated by talking through a telephone. Whilst we have no hesitation in asserting confidently that not the most persuasive and golden-tongued canvasser in the employment of the National or any other company ever claimed this amongst the many advantages of the telephone, we deny not only that the telephone cultivates bad English, but we even assert that to a certain extent it cultivates good English.

What concern has the telephone with diction, and, indeed, how does it affect language in any way except to induce a tendency towards brevity? Will the telephone incite a man to split his infinitives, misuse "and which," and indulge in clumsy participial phrases? We think not. On the contrary, if the tendency towards brevity will teach him to "walk" instead of "proceed," to avoid "venturing to think" and "availing himself of opportunities," and other cumbersome or meaningless locutions acquired from his faithful instructor, the newspaper, we may claim that the telephone so far from impairing purity of diction is a direct incentive to simplicity, and thus a decided step in the direction of good English.

PORTRAITS.

IN addition to those already announced reproductions of the portraits of Messrs. A. E. Cotterell, W. W. Cook and John Scott on sunk art plates are now obtainable at *6d.* each. Those of Messrs. Arthur Watts, Harvey Lowe and J. W. Campion will shortly be ready.

HIC ET UBIQUE.

THE *New York World* gives the following amusing account of the steps taken by residents to prevent a telephone company planting poles in the street:—

Hostilities began Tuesday, when a gang of men from the telephone folks appeared in Sixty-ninth Street, between New Utrecht and Seventeenth Avenues, and dug holes on the sidewalk in front of the detached houses. Mrs. Margaret Splane, a widow of 70, jumped in the first hole that was dug.

"You'll have to dig me out!" she cried.

Mrs. Jennie C. Marshall, Mrs. Samuel Harrison and other women on the street flocked to the scene, and as fast as a hole was excavated by the men there was a woman all ready to jump into it. By the time the line of human posts had extended half a block the gang drew off for fresh advice from headquarters.

Twenty-five men of the vicinity guarded the holes all night, and yesterday, while the women stood in the holes again, Mrs. Edward Middleton and Mrs. Albert Herman hurried to Borough President Coler with a petition. He revoked the telephone company's permit on the ground that the street had never been legally opened and was therefore private property. The women held a jollification last night.

We do not quite follow the argument that because the street had never been legally opened it was therefore private property. Would the opening of a private road "legally" make it public property, or have we failed to grasp some subtlety of American syntax?

OUR Manchester correspondent informs us that on the drop scene of the Hippodrome of that city a magic lantern notice is thrown informing the audience that if doctors and others urgently required will leave their names and the numbers of their seats at the box-office they can be called out of the threatre in response to any inquiries for them over the telephone. Besides the usefulness of this proceeding in cases of emergency, it might also be used as a good advertisement of the extensive practice of a rising doctor. Modern surgeons could go one better than Mr. Bob Sawyer in *Pickwick Papers*, who, it will be remembered, engaged a boy to disturb him regularly every Sunday in church in order to create an impression of the magnitude of his *clientèle*.

ONE of those striking advertisements which cheer but do not convince stares up at us from an American journal in fat black letters: TALK WHILE YOU EAT, and goes on to inform us that the telephone can be brought to our table and connected with the exchange. It is not made clear whether the advice is meant as an axiom of polite breeding, or as a means of improving the transmission on that particular company's lines. In England we are taught in early youth: "Don't speak with your mouth full."

THE vitality of the telephone societies, to which we referred in an editorial last month, is evidenced by various new features in their programmes. A good idea on the part of the Bradford society is to set aside evenings for short papers by the local staffs at the Keighley and Halifax centres. The Gloucester society have arranged for branch meetings to be held at Cheltenham to save members in that town the inconvenience of journeying to Gloucester. In the Herts and Beds district, which is a scattered one, we see that Mr. Langdon-Davies read a paper at Bedford and Watford. New societies have been formed by the Exeter staff and by the Liverpool operators, to which we wish all success.

A FAULT was recently reported in the Potteries district, and when an inspector was sent round to the subscriber's premises it was found that the hand microtelephone had been detached from the instrument and locked up in the safe, so that the office boy could not make use of it in the subscriber's absence!

OUR Wolverhampton correspondent sends us information of a new electrolyte. A report reached the test-room that a telephone was out of order, and on the inspector examining the cells he found that one having run dry the subscriber had filled it up with ordinary machine oil, quite thinking this would meet all requirements and save the Company trouble.

TENACITY.

BY J. W. MARSHALL, *Eastern District, London.*

TENACITY! This should be one of the chief attributes of the contract officer. Without it he can do little; with it he can do much.

It is a surprising thing to find in a department (sometimes working side by side) the successful contract officer, the man who never seems to be at a loss for an order, the man who "always gets them," and the man who just manages to bring in a few orders now and again. How can we account for this strange fact. Is it because one district is better than another in which to obtain orders? or because one is a business, and the other a residential district? or because completions can be made more quickly in certain areas than in others? Certainly, there is something to be said for these points, but the great thing is that the successful man possesses tenacity of purpose; the other does not.

In canvassing for orders, it is an axiom that we come across a different type of person every time a call is made. Some are short and sharp in their dealings, others are long and tedious. Some know what they want and have it, while others seem uncertain. It is with the latter class that so much can be done. Here persistence will gain a victory. Here tenacity will pull off an order.

It does not do because a man seems indifferent to come to the conclusion that he does not want to do business, most likely he does; but, first of all, he wants to see that the Company's representative is interested in his having a line, is anxious that he should sign a contract, and if the contract officer will just "fasten on" good results will follow. "Fasten on." Yes, and once having got the ear of a sympathetic listener there should be no letting go until an order is secured.

"What is the use of worrying a man when he does not want the telephone?" How often is this thought uppermost in the mind of the contract officer, when, after calling upon an enquirer several times, he thinks he can make no headway. But it is of use; if it appears that a man can afford to pay for a line, then he should never be given up until he has been made to sign an agreement. Made to sign, because of the arguments put forward by the Company's representative. Made to sign, by the interest shown by the caller. Made to sign, by the everlasting "stick to it" principle, by the tenacity of the contract officer. Of course it is not meant that a man should be bored or annoyed; tact here as elsewhere must be exercised. But still the thought "I mean to have it" should ever be uppermost in the caller's mind. Try it, and you will be surprised at the result.

CORRESPONDENCE AND TELEPHONE REPLIES.

BY W. A. VALENTINE, *District Manager, Glasgow.*

A GENERAL instruction having been received from Head Office to put into practice as far as practicable the telephoning of replies to correspondence, it may be appropriate to give some facts regarding the experiment, which has been proceeding for over twelve months. The suggestion was made by one of the chief officers here, and after consideration was recognised by Head Office.

The points claimed are—

(1) If it is an advantage from a monetary point of view for the Company's subscribers to telephone instead of write, it should likewise be good for the Company.

(2) A more effective reply can be made by telephone if a responsible officer speaks to the writer of the letter.

(3) A telephone message reaches the subscriber more quickly than a letter.

(4) Inward letters are reduced.

An innate conservatism has to be got rid of when approaching the subject. One has been nurtured in the old-fashioned method of replying to a letter by a written communication, and to have to part with this goes against the grain. In these days of measured rates, however, our business is to sell calls, and first of all we must show in practice that we believe in the telephone.

To take the points claimed in their order—

(1) *Telephone Message Cheaper than Letter.*—The entire cost of an outward letter (leaving out the dictator's time, which may be taken as the same under both systems) has been calculated at 3·81*d.* I find that the average cost (to the subscriber) of a telephone call under the new measured rates (excluding the installation charge) is 1·05*d.* (call and reply).

During the test carried out here figures were extracted at three different periods, and they show the following results when compared with normal figures prevailing immediately before the introduction of the new system :—

	First period. Per cent.	Second period. Per cent.	Third period. Per cent.
(A) Reduction in number of documents typed ...	8·4	13	22
(B) Reduction in postage of "general" letters	42	48	64

Item (A) includes *all* documents typed. Confined, as is more correct, to "general" letters, the saving at the first period was 36 per cent. There is some probability of other causes having contributed to these reductions, but this applies chiefly to the later periods, and I have no hesitation in claiming the "first period" reductions as due to the system.

(2) *Telephone Message more Effective than Letter.*—With a measured rate service, and especially with private branch exchanges, one of the most objectionable features of present-day telephoning is gradually being eliminated. The office boy, as a telephone operator and user, is responsible for a good deal of the odium and abuse attaching to the telephone service to-day.

It had to be laid down as a rule that the officer who would have (under ordinary circumstances) dictated the written reply, should, under the altered conditions, telephone, and further should, in every case possible, get in touch with the writer of the letter. When this is impossible, a responsible official is spoken to, and an explanation given; a short note—a few words generally suffice—is written on the letter and initialled, the name of the correspondent being also noted for fear a question should emerge later.

(3) *Telephone Message Quicker than Letter.* Where a letter is received in the morning, a reply by letter is usually delivered the following morning. In telephoning a reply, half a day is saved, the reply generally reaching the writer by noon of the same day. Everyone in business, and especially the busy man, feels the advantage gained.

(4) *Inward Letters Reduced.*—This is a "consummation devoutly to be wished." After a six months' trial it was found that a reduction in inward letters had been effected. What percentage could be directly attributed to the new method, it is somewhat difficult to say, but it stands to reason that doubtful points in a reply can be cleared up immediately by telephone, which in correspondence would mean a second inward letter and a further reply.

The cost of an inward letter (registering, filing, etc.) has been calculated at 0·62*d.* The *whole* of the expenditure is cut away by telephoning, and the time of the officer dealing with the message may again be taken as the same.

The full benefit of the system will be obtained when we have educated our subscribers to make use of it, as well as ourselves; for then, many of the telephone messages which include a question and reply will save the writing of two letters—each of which will be an "outward" to one party and an "inward" to the other. The comparative cost of such communications will therefore be 2 (3·81*d.* + 0·62*d.*) = 8·86*d.* against 1 05*d.*, the saving being divided between the parties.

A phrase I have heard used by one of the Company's chief officers occurs to me, "Is there no snake in the grass?"

Yes, there is; if supervision is not exercised, it will be found that juniors will be allowed to telephone replies; this is fatal—the clerk or officer dealing with the matter must telephone. If a written reply were given, the dictation would not be left in the hands of an office boy, nor should the telephone reply be left in irresponsible hands.

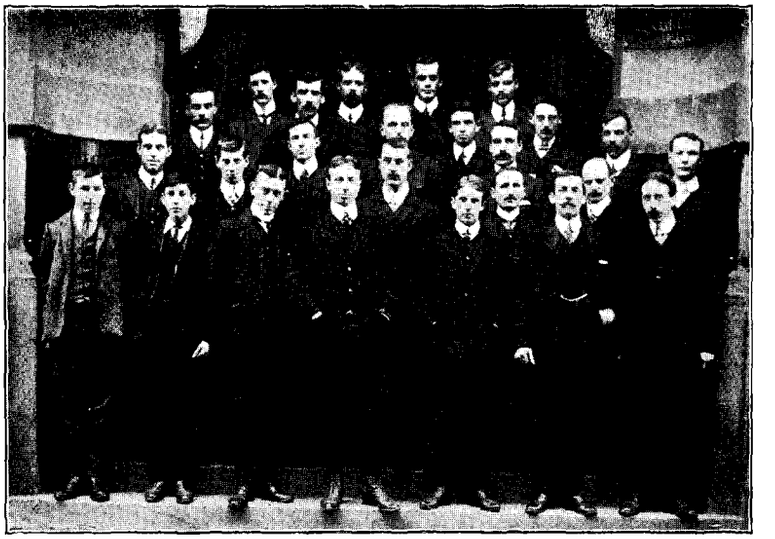
Where a correspondent refuses to accept a telephone reply, no objection should be taken to a written reply being sent. It is unnecessary to point out that the revenue of the Company will be very much augmented when subscribers are induced to follow the lead given by the Company. Example, however, is better than precept, and when the Contract Departments fully grasp the value of the practice, it will be an added argument in pushing their wares.

AMBULANCE WORK.

THE friends of Mr. R. J. Payne, of the Metropolitan Cashier's Department, will be pleased to note that he has gained the medal awarded by the governor to the most successful student in the class for nursing and hygiene in connection with the St. John's Ambulance Lectures at the Cripplegate Institute. Mr. Payne is certainly to be congratulated as the class of work covered by these lectures is much in advance of the ordinary first aid course and embraces more difficult subjects. His own pleasure in the event must however have been marred by the sad loss he sustained the same night in the death of his mother.

An ambulance box has been supplied by the Hospital Saturday Fund for the offices at West India Dock Road, E., and placed in charge of the Local Engineer, Mr. A. F. Paddon. Mr. Paddon as long ago as November, 1893, passed his first aid examination and subsequently passed three other examinations, receiving his warrant as an officer of the ambulance association on March 8, 1898. "East" should therefore be fortunately situated in cases of accident or sudden illness, in having Mr. Paddon's experience at their disposal.

BRISTOL EXCHANGE AND INSTRUMENT STAFF.



COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from p. 173.)

The *Journal of the Society of Arts*, contains an advertisement of the Cheap and Uniform Colonial and International Postage Association, with a report of its extraordinary meeting.

Rowland Hill, in *His Life*, p. 241, says:

"Towards the end of 1851, learning that an influential association had been formed for obtaining a low rate of transmarine postage, and fearing that the Government might be placed in the dilemma of having either to resist a popular demand or submit to a very serious loss of revenue, I proposed a middle course, viz., a reduction of colonial postage generally to sixpence the half-ounce, but this was not sanctioned till early in 1853."

This may be the origination of the Universal Penny Postage scheme so ably conducted by Mr. Henniker Heaton, who has supplied the most vivid and graphic description of personal experience during the Jamaica earthquake, as an old Australian journalist whose right hand has evidently not yet lost its cunning. "Soon after his arrival in Sydney as a young man from the old country he became the editor of a weekly paper in a rising township in the far west of New South Wales. But he gained most of his journalistic experience as the travelling representative of the Sydney *Town and Country Journal*. In the interests of that paper he visited almost every town of importance in the Commonwealth. He eventually married the only daughter of the proprietor of the paper, the late Samuel Bennett. Under the provisions of her father's will, Mrs. Henniker Heaton is a large shareholder in both the Sydney *Evening News* and *Town and Country Journal*. Mr. Henniker Heaton, a quarter of a century ago, published an *Australian Dictionary of Dates and Men of the Time*, a useful work of reference for the period of which it treats, but now, of course, leaving something to be desired. He has often thought of bringing it up to date, but some new delinquency on the part of St. Martin's-le-Grand was always diverting his thoughts and energies in a different direction."—The *Daily Chronicle*.

The Mulready covers and envelopes were printed by Messrs. Clowes, in sheets of twelve, from stereoscope casts, in three horizontal rows of four. As each cast was separate and bore a different number, the envelopes on a sheet are not consecutively numbered. I have a proof on Indian paper and on card. Proofs are known from the brass blocks, also some 24 imitations lithographed from stones used to illustrate *Le Timbre-Poste*, October, 1868, and include the Ocean Penny Post and other envelopes, some of which I show.

The Mulreadys proved to be inconvenient, and brought forth a number of caricatures and parodies. The most notable of the former is perhaps that by Thackeray. Of the parodies, that in the *Ingoldsby Legends*, by Barham:

"The Manager rings, and the Prompter springs
To his side in a jiffy, and with him he brings
A set of those odd looking envelope things,
Where Britannia (who seems to be crucified) flings
To her right and her left funny people with wings,
Amongst Elephants, Quakers, and Catabow Kings,
And a taper and wax,
And small Queens' heads in packs, which, when notes
are too big, you're to stick on their backs."

The biggest man will now collect all firearms. As it is alleged, some people remarked the artist had mulled it already. So strong was the ridicule that the stock remaining was destroyed in 1841.

The 1*d.*, black, was issued on May 6, 1840, in some parts, but owing to the omission of the word "not" from instructions the issue was delayed in most cases till June, 1840. The earliest known copy with red obliterations is May 6, the first day of issue; with black, Oct. 31, 1840. These and the Mulreadys were the first means given the public of prepaying postage, previously having to hand in their letters with the amount of postage, according to distance, at the window of the post office. Notification of this issue and the Mulreadys was given in the circular of April 29, 1840, with a pair of 1*d.*, black, stamps affixed. Although part of the very first to be printed, they have a woolly appearance, owing to the haste for the issue not allowing time for the plate from which they were printed to be hardened. The head of the Queen was drawn by Corbould from a medal by Wyon, to commemorate Her Majesty's visit to the City of London on Nov. 9, 1837, and was engraved by Frederick Heath. Lord Crawford has a specimen from the original—Die I—without the engraving of the head.

I have lately secured an essay on "Banking" by T. Joplin, 1827, which is historical, as it proves a fact not generally known that the process and pattern used was patented in 1819 by W. J. Perkins for protecting bank notes against forgery, and employed in 1840, of identically the same pattern and in same way, to prevent forgery of the first postage stamps of England. If you compare the engraving in the book with a 1*d.*, black, this will be apparent, the principle of the invention being founded on the fact that no engraver can possibly copy a design several times without variations being noticeable. There are four distinct species of engraving; the vignette and two heads by a historical engraver; the lettering by a writing engraver; the small lettering where the words "five pounds" are repeated 1,100 times by a stamp engraver; the ornamental border by machinery.

In 1819 a Commission, of which Sir William Congreve was a member, was appointed to inquire into the best means of making bank notes most difficult to forge. Sir William Congreve and Messrs. Perkins & Heath submitted plans, and the latter firm's were approved the better. The former, however, endeavoured to produce the same protection by printing the engraving the number of times necessary. It is, however, a fact that bank note and other paper shrinks after wetting, and under the proposal the note would have to have been wetted and dried sixteen times. However, Sir William, by a pamphlet which was very plausible, obtained the order for engraving the back of some of the country bank notes.

The 1*d.*, black, was printed on hand made paper, watermarked with a small crown, made by Faircroft & Co., printed and gummed afterwards by Bacon & Petch at 7½*d.* per 1,000 (the present price is, I believe, £30 per million) in sheets of 240, in rows of twelve, lettered in bottom angles only, A°A to T L. Being hand-made, the paper varied from thick to very thin, as the contract was to supply in reams of 500 sheets of a certain weight. Guide lines were lightly engraved on the plates to direct in placing the die, and only show when too deeply engraved. They may be found horizontal and vertical in N.E. and

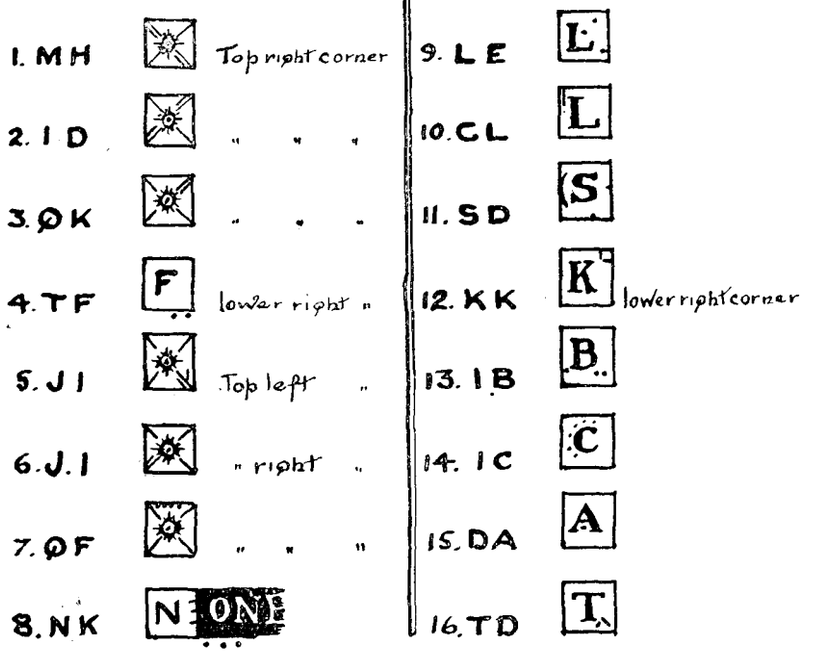
in S.E. squares, and through value. And, in addition, there are lines actually caused by hairs dropping on to the plates. As the letters were put in by hand punches, it follows that the workmen sometimes made mistakes, and the following and other double letters may be found:—

D over I	F over F	M over M	Q over S
D „ D	H „ H	T „ T	E „ F

The V.R. was intended for official purposes, but was not brought into use, and as there were 5,000 sheets plus the sheet for the Archives, less 3,302 destroyed, leaving 1,698 sheets, of 240 stamps, the price is far too high, more especially in comparison with the "Royal" 1*d.*, black, of which there were only 960 stamps.

In stamps PJ, PK, PL, traces of stars under the letters V.R. may be found. It is curious that the marginal inscription, price 6*d.* per label, 1*s.* per row of twelve, etc., was printed, considering that the stamps were for Government use only. One plate only was prepared lettered A instead of being numbered. In April, 1841, the 1*d.* was printed in blue, to decide whether the new 2*d.* value with lines or the 1*d.* should be in that colour, and again in October with a trial fugitive ink.

The younger members of the Royal Family being desirous of possessing a 1*d.*, black, and none being available, in 1864 four sheets only were printed in that colour from Plate 66, Die II, on large crown paper with the watermark inverted,



and is commonly known as the Royal 1*d*, black. I believe one sheet went to the Prince of Wales, one to the Duke of Connaught, one to Princess Clementine of Belgium, one to the Emperor of Germany.

The present Prince of Wales is the Honorary President of the Royal Philatelic Society; he takes a great interest in the society and is an enthusiastic collector.

An interesting study can be made of the secret marks engraved on the plates to assist in detecting forgeries. I show a few and have several more; a list is given in the *Stamp Collector*, December, 1903.

Generally speaking, for the lettering there were two sets of punches used, very much alike, except the "J," which in one set has the bottom square on the right, and is much rarer than the better-formed one, and probably only used with Plate 10 and possibly 11.

The Government were considerably exercised for a means to prevent the extensive cleaning and re-use of stamps, and in August, 1840, instructed Messrs. Bacon & Petch to print in fugitive inks of various colours several of the 1*d.*

stamps to be experimented upon with trial obliterations, it being proposed to change the colour of the 1*d.*, black, so that the obliteration should be more obvious. The firm therefore printed on plain white wove paper, from the existing plates, various stamps in different colours, waxing the top right corner of plate to prevent it inking, and leaving the letter blocks blank. After experiments had been carried out, it was decided to change the colour to red-brown, and it was further decided from experiments with the 1*d.* to print it and the 2*d.* in more fugitive ink, and to add to the latter the two white lines, principally to distinguish it from its predecessor. I am fortunate enough to have the trial 1*d.* stamp in black fugitive ink and in its new colour of red-brown, a block of 24 as issued, the 1*d.* in blue, and in addition the latter with trial cancellation, which was a far too efficient obliteration.

I have Circular No. 3 to postmasters sending out specimen stamps, and that dated in January, 1841, with 1*d.* in the new colour, and the 2*d.*, blue, with lines added, but with letter blocks left blank from small sheets of twelve printed to show the effect of the white added lines. With this circular there are also specimens of the first embossed 1*d.* stamped envelopes, on Dickinson thread paper, in two sizes, which were substituted for the Mulreadys. I also have the circular of April, 1841, with the 2*d.* envelope, referred to in the January circular.

Other proposals were made and, as an historical item, the following, which I have just acquired, is interesting:—

"Polytechnic Institute, Regent Street, April 21st, 1841.

"My Lord,—I have the honour of sending a new Postage Stamp, with its cost, for your lordship's inspection. It was promised some time since to your lordship, but so many delays have taken place to prevent its completion.

"I have the honour to be your lordship's most obedient and humble servant,

"To the Right Hon. Earl Litchfield, etc. etc. "R. W. SIEVIER.

"P.S.—Mr. Rowland Hill has also some before him."

The three stamps enclosed are mounted on a printed form, thus—

NEW POSTAGE STAMP

Proposed by Mr. R.W. SIEVIER, *F.R.S.* & Mr. E. SCRIVEN, *Historical Engraver to His late Majesty George the Fourth.*

The principle of this Plan embraces two material objects:—First, the prevention of fraud on the Revenue; and, secondly, the production, at very small cost, and, with extreme rapidity, of any quantity of Stamps that can possibly be required.

With reference to the first object, the Engraved Stamp which has been in use, is found inefficient. There is a liability to fraud by imitation of the Stamp; and fraud has been effected by removing, by well known chemical means, the evidence of its having been already used, the *same Stamp* passing through the Post Office *several times*.

The last species of fraud may be rendered almost impossible by the new principle, while the combination of efforts it requires in the Die sinker, the Engine-turner, and the Mechanic, must evidently present the greatest obstacles possible to fraudulent imitation.

The second object is not less effectually accomplished by the new principle; for such are the powers of the machine which Mr. SIEVIER *has invented*, such the certainty and extraordinary rapidity with which the impressions may be thrown off, that Mr. SIEVIER and Mr. SCRIVEN will undertake to deliver *a Million* of these Stamps daily, at an expence of only 1½ per thousand *the printing* in *one colour*; if, in *two colours*, at 2½ per thousand; and, if *including the paper*, at 3½ per thousand—thus fixing at once the extent of the cost to Government.

The Plan being entertained, it can be also carried out for the *present envelope* or any other such stamp.

Lastly—The entire expence of erecting all the machinery, for working out this proposition, to be at the risk of the proposers, the working of it being granted to them for a given period on its adoption by Government.

The proper machinery not being erected, the above impressions are taken off by inadequate means, and are consequently imperfect.

Albion Press—E. Hart, 5, Seymour-crescent, Eaton-square, London.

(*To be continued.*)

CORRESPONDENCE.

AUXILIARY CALL OFFICE SIGNS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE article by Mr. Stevens on "Auxiliary Call Signs," in last month's JOURNAL, reminds me of an idea I have long had, that all call signs should be made in the shape of a telephone, so that he who runs need not waste his time to read, for the sign would then speak for itself. Personally, I do not think we are as clever as our forefathers in the matter of making signs speak for themselves by their shape. Note old signs such as the barber's pole, etc.

There is no doubt but that telephone call offices should be clearly indicated by a sign that could be distinguished a long distance off, as it is often most important and urgent to use call offices in case of accident, fire, urgent business, etc.

Douglas, Nov. 4. G. GILLMORE, District Manager.

TELEPHONES AT BANKS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

FOLLOWING on recent Press comments on the exploits of that up-to-date and brainy gentleman, Mr. D. S. Windell, and his successful operations with various banks, I think it an opportune moment to mention that up to the present the Company has, in the Sussex area, agreements for exchange service to fifteen branches of the various banks, a considerable number of which have been quite recently connected.

I might also mention that I hold several testimonials from the various managers, testifying to the utility of exchange telephone service to their business generally.

I mention this as it may be read with interest by a contract manager elsewhere, who is endeavouring to move a stubborn and conservative bank official into a more modern line of thought, and have a telephone.

I can only assume that the various bank managers in this area are more up to date than in some other areas, and that these connections are not entirely due to more efficient contract work.

Brighton, Nov. 19. D. WALLACE, Contract Manager.

"TRAFFIC REDISTRIBUTION."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I WELCOME the opportunity afforded by Mr. Coombs' supplementary article in the October issue of the JOURNAL, and his letter in the November issue to continue the correspondence.

I have to thank Mr. Coombs for his treatment of my criticism, and I trust the correspondence will effect the best solution of the problem. In this connection it would be advantageous to have the views of other "traffic" men on the subject.

In the second paragraph of Mr. Coombs' letter he admits that figures are very necessary and helpful as far as they go. This being so, would it not have been better to have procured figures first and confirmed them by "opinion" or "experience," whichever you prefer to call it, if this was considered necessary?

In Mr. Coombs' first article he states that there were *many* lines about which there was a difference of opinion as to calling rate, and again there were *many* not mentioned at all. This being so, it seems to prove, in my opinion, the absolute necessity for recording the calls.

Mr. Coombs states that it is a practical impossibility to obtain for any set period an absolutely normal condition of things to apply to all unlimited lines. If you take, as I suggested, a representative week you will, I consider, come nearer the actual facts than by a statement of "experience," and in view of the record being taken for a week Mr. Coombs' reasons against the calls being recorded seem more hypothetical than real.

Is Mr. Coombs, in his October article, correct in claiming that the figures he shows prove that the positions (panels) are equally loaded. It will be agreed, I think that the panels, not the sections, should be as near as possible equally loaded as the less "team" work necessary, in view of the operators working in the way of each other, the better. Is it not the case that the calls shown are the operators' loads?

With regard to the filling in of the lines not noted, I would not have called this in question if Mr. Coombs had stated that these should not *seriously* affect the evenness of the load in any way. Unless the calling rate is the same for all these lines it would have been possible for all the busy lines to have been put on certain positions and the quiet lines on other positions.

I do not claim that the connection of auxiliary lines on the same position as main lines would entirely overcome the difficulty I called attention to, but as the majority of the calls made by the subscriber will be answered by the same operator it lessens it considerably. It must, however, be observed that all the lines are not controlled by the same fuse.

In conclusion, I may state that subsequent to the writing of my first letter, I have been favoured with a copy of the Instructions in connection with the transfer of lines from "magneto" to "common battery" exchanges in the Metropolitan area. It is therein instructed that a three days' record between 10 a.m. and 12 noon, hourly, be taken, distinguishing between local and junction calls and the distribution in the new exchange arranged in accordance with it.

Glasgow, Nov. 18. T. RODGER, Traffic Superintendent.

A TESTIMONIAL.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE following extract from a letter received from a subscriber in the Southern province renders a welcome tribute to the accuracy of the operators' work in recording calls in the exchange. The subscriber is a busy solicitor, and may be trusted not to have written the letter from any idle sentiment. The operators in the exchange concerned have always had a reputation for careful and correct work, and the writer thinks they thoroughly deserve the tribute now paid to them:—

"As I know that you receive many (and sometimes well-founded) complaints, I should like to take this opportunity of expressing my appreciation of the unfailing courtesy displayed by the operators at the exchange, and of the almost unfailing accuracy and dispatch with which they answer calls. I may add that I have a system of booking my calls, and that my register agrees almost exactly with the number of calls debited to me."

Nov. 12. LOCAL CORRESPONDENT.

CENTRAL BATTERY INSTRUMENTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REPLYING to Mr. Stewart's letter in the November issue of the JOURNAL, let me thank him for the information that the bell coils are not in the speaking circuit. I fail to see how he inferred that they were. Naturally, I am fully aware that there are several circuits in use which do not contain repeating coils; in fact, taking the matter a step further, even the induction coils themselves could also be dispensed with, and good transmission still be possible between short distances. But when dealing with city subscribers connected through repeaters at the Central Exchange and using one common battery (which circuit I take it Mr. Stewart was considering), the repeating coil is of vital importance to obtain *good commercial speech*. To give a definite name to the winding of the induction coil (when considering outgoing speech), seems to develop into a matter of opinion. The word primary means chief, first, or of highest importance. Now, agreeing that the 30ω winding does act as a primary to some extent (this was never questioned), I still cannot accept it as *the* primary (or the coil of most importance), simply by virtue of its inducing a slight augmenting current in the 15ω coil, especially seeing that the 30ω winding can be eliminated and the transmission of outgoing speech not appreciably effected. Mr. Stewart and I evidently agree as to the general action of both the induction and repeating coils, differing only in the determining of the primary circuit. Referring to Mr. Blight's article entitled, "The Operation of a Common Battery Subscriber's Instrument," which appeared in the December, 1907, issue of the JOURNAL, I find that he explains the action of the coil very lucidly, but wisely refrains from speaking of it other than "as the 15ω winding." and "the 30ω winding," which is evidently the best way. I appreciate Mr. Stewart's remarks that his article had to be condensed for publication, but consider that when he says "one cannot even refer to the windings as primary and secondary," and then immediately makes the bold statement "the 30ω winding being *the primary*," he ought to have qualified it, if the JOURNAL is to attain its object, that is, to educate the staff generally.

Bradford. J. SPEIGHT.

PRODIGALITY IN CORRESPONDENCE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

YOU remarked in your last issue that I had over-stated the case when I said that the suggestion of a new heading for our service memoranda had been adopted, adding that it was only adopted by those districts and departments which thought it advantageous.

I crave a little space to explain that why I said it had been adopted was because I was informed by the Stationery Department, on July 31, that my suggestion had been approved in essence, and that in a slightly modified form it would be issued to all the districts when the present supplies of memoranda paper had been exhausted. Besides this, the Stationery Department, with whom I confirmed the statement quoted a few days ago, told me that, if a district asked for memoranda forms other than the new ones now being issued, they would not receive them.

In view of these facts it is evident that the suggestion has not been adopted by such districts as liked the idea, at their own option (as your note puts it), but adopted *for* all the districts by the Company.

I would not trouble you with these details but for the fact that your note charges me with exaggeration, and I would ask you to kindly correct this.

The real point (which the writer of your note has evidently missed) was, of course, not just how much or how little the suggestion for cutting things short on a definite plan in our correspondence had been adopted in the Company's service, or, indeed, whether that adoption came from Headquarters or the districts, but that the very thing which the writer of your article disparaged had already been approved by the Company, not only for district use throughout the kingdom but also for the Head Office Stores Department.

London, Nov. 20. P. H. C. PRENTICE.

[We find that Mr. Prentice is correct in saying that a modified form of his suggestion has been adopted for official service memorandum forms in the districts generally. We were somewhat misled by the fact that it is not used in the Secretary's and General Superintendent's offices.—ED., "N. T. J."]

THE TELEPHONE AND THE THEATRE.

THE Manchester Hippodrome displays at each performance on the bioscope screen the following notice:—

"Doctors and other patrons are invited to leave their name and number of their seat at the box office, so that notification may be made to them in the event of their being required through telephonic communication."

LOCAL TELEPHONE SOCIETIES.

Bradford.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 16, social evening; Nov. 11, "Lightning and its Effects on Wires and Apparatus," Mr. G. Wicker; Dec. 9, short papers, members of Keighley staff; 1909: Jan. 21, "Notes on Engineering Construction," Mr. J. M. Shackleton; Feb. 10, short papers, members of Halifax staff; March 10, "Stores and Storekeeping," Mr. W. Knight; April 7 competition, members' night; April 21, competition, ladies' night. The opening meeting of the session was held on Nov. 11, when the president, Mr. G Wicker, Local Manager, Huddersfield, gave an interesting address on "Lighting and its Effects on Wires and Apparatus." Several interesting experiments were shown with the aid of the Wimhurst machine and Leyden jars. There was a fair attendance of members and considerable discussion.

Liverpool Operators.—Meetings of the operators and also of the supervisors and monitors of the Central Exchange have been held monthly for the past two years, when interesting papers and lectures have been given by members of the operating staff, and the Exchange Manager, but in no case have reports of these meetings been published in the columns of the JOURNAL. That these meetings have contributed towards greater efficiency in the Central Exchange service is exemplified by the fact that the total operation- *i.e.*, time taken to answer and disconnect), has improved from 19·7 seconds in January, 1906, to 8·8 seconds in September, 1908. It is now felt that with an operating staff of nearly 400 in the Liverpool and Birkenhead districts a recognised society should exist, and the usefulness and scope of the meetings enlarged. With that object in view, a general meeting of the operating staff is shortly to be held, when the officers, etc., will be appointed for the present session. An interesting syllabus of traffic matters is already in preparation.

Brighton.—At the meeting of the Brighton Telephone Society held on Nov. 18, Mr. L. Parsons (Chief Clerk) gave a lecture, entitled "Office Work and its Relation to Technical Staff." Mr. C. F. Moorhouse (District Manager) occupied the chair, and several members of the staff who are not members of the society were also present. Mr. Parsons showed that no department of the business could be carried on independently of the others, and pointed out that it was desirable that every member of the staff should have some knowledge of the working of departments other than that in which he was situated. The lecture was followed by the usual discussion, and Mr. Parsons was accorded a hearty vote of thanks at the close of the meeting.

Luton.—The first meeting of this society was held in the King Street offices on Oct. 22; 39 members were present and listened with much interest to a lecture given by Mr. J. H. Wilson (District Manager), entitled "The Development and Future Prospect of Telephony." Mr. Wilson's remarks were interspersed with numerous anecdotal reminiscences, and he claimed the undivided attention of his audience for the greater part of two hours.

Bedford and Watford.—Mr. Langdon-Davies, Local Manager, Bedford, recently read his paper on "The Development of Telephony" to large and appreciative audiences at Bedford and Watford. His remarks were fully illustrated by lantern slides. Mr. Davies also exhibited several original instruments and gave a demonstration of the electrophone.

Portsmouth.—A meeting was held at Marie Le Bonne Hall, on Nov 10, when the subject for the evening was "Knotty Points." Previous to this a series of lantern slides were shown, many of which were made by the members of the society. An interesting discussion, in which many of the members joined, took place, and a bumper attendance showed that this form of discussion promises to become popular.

Birmingham.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 13, "Midland Exchange Illustrated," Messrs Baldwin and Cornfoot; Nov. 3, "Operating Matters in Connection with Midland Exchange Transfer," Mr. Piggott; Dec. 1, competition papers, "Common Battery Working," Messrs. Gray and Tilt, "The Company and its Subscribers: A Criticism," Mr. H. Brown, "Naval and Military Application of the Telephone," Mr. Shorthouse; 1909: Jan., "My American Trip," Mr. Goddard; Feb. 2, "Some Notes on Management," Mr. Scott; March 2, "Notes on Engineering Construction," Mr. Fray; March 23, "Applied Transmission," Mr. H. P. Lloyd; April 6, competition papers: "Keeping in Touch," Mr. Rhodes; "Magnetic Properties of Iron as used in Telephony," Mr. Ridsdale; "Exchange Maintenance," Mr. Tuffin.

Hull.—The second meeting of the session was held on Oct. 23, when a paper was given by the District Manager, Mr. C. C. Worte, entitled "Simultaneous Telegraphy and Telephony," the chair being occupied by Mr. Tattersall, the Local Manager. The paper was illustrated by a series of lantern slides showing different circuits and the method of joining up the different towns to get the fullest possible use from available circuits. The subject was dealt with from several points of view: firstly, the technical; then the advantages and economy of these circuits; the extra revenue likely to accrue, and the new field for development which would be opened out were also touched upon. A keen discussion followed, several points being raised which were carefully explained by the lecturer. The syllabus for the Hull Telephone Society is now complete, and includes the following items:—"Is the transfer to the Post Office going to be beneficial?" (debate); "Simultaneous Telephony and Telegraphy"; "Traffic"; "Aerial Line Construction"; "Wayleaves from a Wayleave Officer's Point of View"; "Duties of a Supervisor"; "Disturbing Effects in Alternating Current Circuits"; "Electrical Terms and Units"; "Transmission"; "The Training of an Operator"; "The Construction of a Common Battery Switchboard"; "Observation Service Testing"; "Automatic Boxes"; "Supervision and the Relation between Supervisor and Operator." The first three meetings have already taken place.

Oldham.—The first meeting of the session 1908-9, of the South-East Lancashire Telephone Society, was held at the Café Monico, on Oct. 29, 1908. An address was delivered by the president, Mr. A. Pugh, upon the subject of "Intelligence in Work." Illustrations of the value of this were mentioned in connection with the various departments of the telephone business. Mr. W. B. Cheetham, one of the vice-presidents, occupied the chair.

Hanley.—An inaugural meeting was held in the Mecca Café on Oct. 23. Mr. John Scott distributing the prizes, and also the certificates obtained in the Correspondence Classes for 1907-8. The members afterwards participated in a whist drive. The first paper was read on Nov. 22 by Mr. S. E. Goodwin, on "Stores and Storekeeping." Various points were dealt with, and an interesting discussion followed.

Manchester.—The first paper of the present session was read on Oct. 23 by Mr. G. F. Staite on "The Provision of Junctions." The Chairman (Mr. Magnall), in his opening remarks, commented on the changes in the staff since the last session, and thought that the telephone society had been the means of making those advanced better fitted for their new positions. The essential qualities of good junction service were touched upon, and the false economy of inadequate provision, the value of accurate records in the past for the purpose of forecasting; the efficiency of junctions, and the problem involved in forecasting future requirements; careful investigation of past experience, and intelligent consideration of future probabilities. Lantern slides were shown illustrating the points raised, and a very satisfactory discussion followed.

Blackburn.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 23, inaugural address by the president, T. A. Prout, Liverpool; Nov. 20, "Co-operation," J. Airey, Cost Clerk, Blackburn (criticised by J. Lightbown, Clerk, Burnley); Dec. 18, "Maintenance," W. J. Storey, Inspector, Accrington (criticised by R. Chambers, Chief Inspector, Burnley). 1909: Jan. 22, "Returns and their Preparation," G. Stevenson, Chief Clerk, Blackburn (criticised by J. F. Abbott, Cashier, Blackburn); Feb. 19, "Blackburn Underground," G. H. Frost, Engineer, Blackburn (criticised by F. Moon, Assistant Engineer, Burnley); March 19, "Telephonic Transmission," B. S. Cohen, Engineer-in-Chief's Department; March 26, prize papers.

At the first meeting on Oct. 23 the president (Mr. Prout) delivered his inaugural address, in which he dwelt with many historical and other events in telephony. The address was illustrated with a very fine set of slides. The lecture was most entertaining and instructive, and was thoroughly enjoyed by the audience. Mr. Prout also organised two interesting competitions, and offered suitable prizes for the winners. These were keenly competed for, and caused much merriment. Thirty operators attended, the total attendance being 103; the percentage of members present was 89 per cent. Following Mr. Prout's address, light refreshments were served, the remainder of the evening being given up to songs, recitations and instrument solos. A hearty and unanimous vote of thanks was accorded Mr. Prout, not only for his address, but also for the great interest he had taken in the society and the assistance he had given since its inception.

Glasgow and West of Scotland.—The meeting arranged for Oct. 28 having fallen through, the first actual meeting was held on the evening of Nov. 11. Mr. Valentine presided, and 113 members were present, as well as two visitors. Dr. Magnus Maclean gave a lecture upon "Illuminants" (electric lamps). Arc lamps were first dealt with, their working explained, and samples lit. Particular interest attached to a new type shown—"The Flame Arc." A table of comparative efficiency gave its consumption at ·28 watt per candle-power—about one-third of the ordinary type. The lecturer next dealt with incandescent lamps; first with carbon and afterwards with metallic filaments. Samples of all varieties were lit, their working fully explained, and their efficiency compared. Two samples of the Cooper-Hewitt lamp were shown. It was new to the members and much interest was evoked by its peculiar effect upon colours. Finally a slide was shown giving a comparison of the candle-power hours per 1*s.* to be obtained from every type dealt with, ranging from the carbon filaments at about 400 to the flame arc at about 12,000, taking the Glasgow rate of 3½*d.* per unit.

Coventry.—A very successful evening was held on Nov. 16, at Priory Row Assembly Rooms. Mr. John Mewburn, president, presided over an attendance of 19 members. Mr. S. H. Ings gave a very practical paper on a "Visit to Gerrard Exchange," which was supplemented by a number of statistics, blue prints and a descriptive report of the bulding given by Mr. Ernest Coombe, Assistant Exchange Manager at Gerrard Exchange. A very practical and lengthy discussion was entered into at the close of the reading of the two papers. Points brought out were: Short circuiting on the multiple; how to test faulty registers; wiring up jacks in series and parallel; lending junction multiple; difference in numbering the board, some from 099 others from 100. At the close a hearty vote of thanks was accorded to both Mr. Ernest Coombe and Mr. S. H. Ings.

Glasgow Operators.—The first meeting of the session of the above society was held on Oct. 26, Mrs. B. M. Peters, Matron, being in the chair. There was an attendance of 149 members, being 67 per cent. of the total membership. Mrs. Peters opened the meeting by alluding to the instructive and pleasant meetings which had been held last session, and expressed the hope that the meetings during the ensuing session would prove the same. Mrs. Peters then called on Mr. Rodger to give his address on "Good Service; How to Attain It and Maintain It." Mr. Rodger, after a few introductory remarks, dealt very fully with his subject and referred to the need for good plant, efficient maintenance, sufficient lines and junctions, efficient operating and supervision, and emphasised the need for an abundance of politeness, and the maximum of "team work," accuracy and speed, pointing out many ways in which these could be achieved. Questions and discussion were invited, and the former were suitably replied to by Mr. Rodger. Thereafter the first meeting of the club was held when a programme of songs and pianoforte selections was rendered by members.

Bristol Operators.—The second meeting was held on Nov. 12, when a paper was given by Mr. E. Seymour Cooper, Contract Manager, on "The Relation of the Contract to the Traffic Departments." Special emphasis was laid on the necessity for co-operation between the departments—how every operator could be in effect a contract officer by giving an efficient service. A short *resumé* of

Contract Department organisation was also given, which was much appreciated by those present, and an animated discussion ensued, the meeting being a very enjoyable one. There was an attendance of 81 per cent., Mr. Perkins, District Manager, being in the chair.

Leicester.—The first meeting of the session was held on Nov. 12 at the Foresters' Institute. Mr. Leonard Price (president), occupied the chair. There was an attendance of 43 per cent. of members. The President, in his introductory address, briefly outlined the good things in store during the present session, and emphasised the importance of regular attendance. He particularly asked all junior members to take active parts in the discussions for the value of the training it afforded them. Foreman C. Derrick read a paper called "Notes on Market Harborough Cable Work." This very practical paper dealt with the work of running lead-covered aerial cable, and aroused much discussion. Mr. C. H. Hayne also read a paper describing his recent visit to "Birmingham New Exchange."

Gloucester.—At a general meeting held in the district office, on Nov. 6, it was decided that a telephone society should be formed, and the following officers were elected:—President, Mr. R. A. Dalzell; vice-president, Mr. D. B. Fulton; hon. secretary, Mr. S. G. Hare. It was decided that the meetings should be held every three weeks—on Thursday at 7.30 p.m., and the payment of a fee of 4*d.* per meeting for each member to cover expenses. The number of members joining are 56, as follows:—Gloucester, 25; Hereford, 1; Lydney, 1; Stroud, 9; Cheltenham branch, 20; total, 56. It has been necessary to form a branch society at Cheltenham to overcome travelling difficulties, and the following officials have been appointed: Chairman, Mr. A. D. Pike; vice-chairman, Mr. H. T. McCahey; hon. secretary, Mr. W. A. Taylor. The following papers will be read by the undermentioned on the dates given:—1908: Nov. 21, "Transmission," Mr. D. B. Fulton; Dec. 10, "Instrument Maintenance Work," Mr. A. E. Ryland; Dec. 10, "Stores Ledger Work with No. 5 and 6a Returns," Mr. S. G. Hare; 1909: Jan. 7, "Aerial Cable and General Overhead Construction," Mr. W. J. Hodgetts; Jan. 7, "Party Line Working and Faults," Mr. G. R. Collings; Jan. 28, "Monthly Returns," Mr. W. J. Norman; Feb. 18, "Subscriber to Switchboard," Mr. J. L. de Medewe; Feb. 18, "Faults," Mr. H. G. Henderson; March 11, "Underground Construction," Mr. F. W. Sceats and Mr. H. Millett; April 8, "Operating Subjects," Miss Harrhy and Miss Gauntlett; April 22, "Works Orders," Mr. E. W. Smart.

Cheltenham Branch.—1908: Nov. 3, "A Junior Inspector's Day," Mr. A. G. Hart and Mr. A. R. Wran; Nov. 17, "Practical Operating," Miss J. E. Farr; Dec. 1, "Underground Work and Induction," Mr. A. D. Pike; Dec. 15, "Contract Work," Mr. C. E. Stevens; Dec. 22, "Faults," Mr. L. G. Allen. 1909: Jan. 5, "Transmission," Mr. D. B. Fulton; Jan. 21, "Aerial Cables and General Overhead Construction," Mr. W. J. Hodgetts; Feb. 4, "Operating," Miss F. Thomas; Feb. 23, "Works Orders," Mr. W. A. Taylor; March 9, "Operating Duties and Supervision," Miss Davenport; March 23, "Various Exchange Systems," Mr. R. T. McCahey,

Cheltenham.—The opening meeting was held on Nov. 3. Papers were read by Inspectors Hart and Wran on "A Junior Inspector's Day," and an interesting debate took place.

The second meeting of this society took place on Nov. 17, the Local Manager (Mr. A. D. Pike) being in the chair. An extremely interesting paper was given by Miss J. E. Farr on "Practical Operating," and considerable discussion followed; 100 per cent of the members (the whole staff practically) attended.

Cardiff.—The second meeting held at the St. John's schoolrooms on Nov. 12 was a combined one with the operators' society. There was an excellent attendance, Mr. B. Waite being in the chair. A paper was read by Mr. Napier (Head Office) on "Traffic," illustrated with limelight views. In his opening remarks the lecturer very lucidly dealt with the question of estimating the capacity for new exchanges, showing how necessary it was, in consequence of the enormous expenditure involved in erecting them, to provide sufficient accommodation for existing and prospective subscribers for, say, fifteen or even twenty years ahead, and impressed the necessity that all figures sent in to Head Office should be as correct as possible, in order that their estimates could, as near as possible, be based on accurate figures. He then dealt with the operating side of the paper, and mentioned how necessary it was for an operator to be extremely careful in her peg count. An interesting discussion followed, and the evening was brought to a close with the usual vote of thanks.

Manchester.—On Nov. 6, Mr. B. S. Cohen gave a paper on "Loading Telephone Cables." After explaining, by means of ingenious apparatus, the wave theory, a description of the various types of loading coils in use was given and commented on. Reflection effects and the use of various calls were shown, after which the practical side of distributing the coils and testing. Apparatus for the comparative measurement of cross talk was shown and its use demonstrated. Questions were asked and most ably answered by Mr. Cohen, who seemed only too pleased to answer as fully as possible.

Cork.—At a general meeting, held on Nov. 3, the following officers were elected for the 1908-1909 session, viz.:—President, Mr. A. M. Kidd, District Manager; vice-president, Mr. R. Surplice; hon. secretary, Mr. J. O'Neill; committee: Miss M. Gallagher, Mr. J. Roy, Mr. W. Clifford and Mr. G. Henry. The syllabus for the session 1908-9 is as follows:—1908: Nov. 20, presidential address, Mr. A. M. Kidd; Dec. 4, "Measured Rate Recording and Revenue," Mr. H. Chamney; Dec. 18, "Faults and their Remedies," Mr. J. Roy. 1909: Jan. 15, "Sound" (illustrated), Mr. D. J. Murphy; Feb. 5, "District Office Routine," Mr. R. Surplice; Feb. 26, "Operating," Miss M. Gallagher; Feb. 26, "Stores, and the Method of Dealing with," Mr. G. Henry; March 12, "Post Office and Junction Fees," Miss M. Kells; March 12, "Instrument Fitting from Works Order to Finish," Mr. B. Dooley; March 26, "Contract Work," Mr. J. O'Neill; April 2, "Engineering Work and Outside Faults," Mr. W. Clifford; April 16, "Magneto Exchanges: A Comparison," Mr. H. E. Hayes.

Western (London).—The opening meeting of the 1908-9 session took place on Oct. 1, when business dealing with the programme for the session was transacted. The following is a list of the papers which will be read:—"Exchange Faults," Mr. A. C. Abbott; "Testing Units," Mr. A. Holmes; "Private Branch Exchanges," Mr. G. F. Greenham; "Fault Clerk's Duties," Mr. W. Loveday; "Subscriber's Instruments," Messrs. F. H. Hayden and E. H. Milne; "Central Battery Junctions," Mr. G. Alstrom; "Exchange Inspector's Duties," Mr. J. F. Bennett; "Application of Mathematics to Exchange Inspector's Work," Mr. W. Hills; "Induction Coils, Repeaters and Transformers," Mr. G. H. Bryant; and "Test Clerk's Duties at a Common Battery Exchange as compared with Magneto," Mr. E. W. B. How. Mr. F. M. Hall read a paper on "Automatic Money Boxes," and illustrated same with several diagrams. The paper described the various types of boxes at present in use, and a discussion followed the reading.

A further meeting was held on Oct. 29, when Mr. A. C. Abbott read hi paper, entitled "Exchange Faults," and showed a number of lantern slides giving diagrams and views of equipment at various exchanges. The paper dealt with the various types of faults on exchange apparatus and proved very interesting. At the conclusion of the reading a discussion took place, and Mr. Abbott replied to various questions asked.

Nottingham.—The first meeting was held on Oct. 23, when a paper was read by Mr. G. H. Rastall, Observation Officer, on "A Good Telephone Service." This being the opening meeting of the session there was a very good muster of members and considerable discussion took place on the paper. Previous to the paper being read the vice-president, Mr. C. H. Sibley, apologised for the unavoidable absence of the president, Mr. Coleman. He further stated his intention to give prizes for the best papers read by junior members of the staff.

A second meeting of the society took place at the same place on Nov. 13, Mr. T. Justin, Chief Clerk, Contract Department, giving a paper on the "Contract Officer." Mr. Justin's paper was interspersed with lantern slides, and his remarks were in the humorous vein. The paper was much enjoyed, the lantern slides showing the correct and incorrect methods for contract officers to deal with new business, the examples of canvassing causing much amusement. At the close of the paper a number of questions were submitted to Mr. Justin.

Newcastle.—Owing to the postponement of the meeting arranged for Oct. 27, when Mr. Gill was to give a paper, the first meeting of the session was held on Nov. 19, with Mr. F. W. Gaskins (president) in the chair. Three papers were given dealing with "Jesmond Exchange." The first by Mr. F. W. McArdle was entitled "Overhead and Underground Construction." The paper was exceedingly interesting and instructive, and several questions were put and answered. The advantages of the change were shown by the Chairman, who stated that the present line faults are less than half what they were prior to reconstruction, being less than one per day for 589 subscribers. The second paper paper on "Common Battery Switchboard Equipment" was read by C. Ratcliffe. He described the battery and power plant and also the estimated current taken from the accumulators daily. Three diagrams were submitted and described in detail. A short discussion followed. The third paper, "Operating," was given by J. Gwyther. The work done by operators was described by a large diagram of a recent traffic return. Questions upon the difference between the traffic peak and the operators engaged were asked, and a short discussion followed.

Leeds.—The second meeting of the session was held on Oct. 21, Mr. W. R. Senior in the chair. The paper was entitled "The Romance of Telephony," by Mr. G. H. Sargeant, the secretary of the society. A most interesting and instructive paper was listened to with rapt attention, the speaker gaining the sympathy of the audience straight away. He traced the romance from the first idea of a telephone up to the present time, and showed how first one and then another had taken up the threads (or should we say wires) where his predecessor had laid them down. The subject was tackled altogether in an exceptionally able manner, and all present thoroughly enjoyed the evening. Five members subsequently offered remarks.

The third meeting of the session was held on Nov. 4, the chairman being Mr. W. D. Scutt. The speaker was Mr. W. R. Senior, and his subject was, "Self-Help and Other Help." The following points were made:—"Generalities regarding success were not half as interesting as hard facts. This was illustrated by reference to Jas. Watt and his accomplishments. Self-help and other help were too closely allied to be separated. The age was one of efficiency, strenuousness and competition, and the indifferent and incapable were soon pushed aside, forced to the wall. If the mechanical existed as never before, yet still more so was it the *man* that mattered, the *mind* being greater than any machine. Therefore, it behoved everyone to help himself to knowledge and usefulness, for by so doing he was helped and enabled to help others." The telephonic application of these principles was then given. In the subsequent discussion, Messrs. Lally, Niemann, Sargeant, Cowburn, Scutt and Beaumont participated.

Sheffield.—The second paper of the session was read by Mr. J. Hyde on Nov. 13, his subject being "What is the Ideal Exchange?" After describing the operating of subscribers and junction positions on a manual common battery exchange, he treated of the expense in connection with the multiple as additional sections were fitted. The lecturer also described the transfer system and pointed out its advantages where a large percentage of the traffic consists of junction calls. The automatic system was then explained, and it was shown that with the latest apparatus any class of service could be obtained. Advantages claimed for the automatic system were as follows:—(1) That the speed of the service is not reduced by the opening of sub-exchanges. (2) That the connections between the calling and called subscribers are more quickly effected by the automatic system than by manual. (3) That the cost of adding additional sections does not increase at such a high ratio as is the case with multiple manual switchboards. The paper was illustrated by lantern slides, and was thoroughly appreciated.

Greenock.—The syllabus for the session 1908-9 is as follows:—1908: Oct. 28, opening address, Mr. A. Ramsay Lamb; Nov. 11, "Incentive," Mr. H. R. Lindsay; Dec. 2, "Electrical Testing" (illustrated by lantern slides), Mr. A. Bucklitsch; Dec. 16, "Expenditure—Material, Wages," Messrs. Ross, Smart and Lowe. 1909: Jan. 6, "Overhead Construction," Mr. C. R. Rutherglen; Jan. 27, competitive papers, "The Telephone Service as it Appeals to Me," prize winners; Feb. 17, "Historical Development of Electricity," Mr. R. Audsley; March 10, "Survey of Plant" (illustrated by lantern slides), Mr. J. McClintock; March 31, "Useful Scientific Data" (illustrated by experiments), Mr. P. Smith, jun. The first meeting of this society was held on Oct. 28, when over 30 members were present. The president (Mr. A. Ramsay Lamb) gave the opening address, and took for his subject the need of technical education and the benefits to be derived from attending meetings of telephone societies. The keenest interest was taken in the address by everyone present, and at the close of the meeting Mr. Lamb was accorded a very hearty vote of thanks.

The second meeting was held on Nov. 11, the president occupying the chair. There was a good turn out of members. Mr. H. R. Lindsay, Contract Manager, read a paper on "Incentive." The enthusiastic manner in which the lecture was received showed how highly it was appreciated.

Plymouth.—On Nov. 4 the second meeting of the session took place, Mr. A. R. Wran (Local Manager) being in the chair. At 8 p.m. Mr. W. C. Harris (Instrument Inspector) was called upon to give his paper, entitled "The Maintenance of a Scattered District." The paper showed that the autnor thoroughly understood his subject, and the lecture proved very interesting and instructive. On completion of Mr. Harris' paper, Miss E. Crocker (operator) was called upon to give her paper on "Operating," the paper being read for her by Mr. W. E. Walton. This paper gave an account of various experiences and difficulties met with by the author, and numerous operators' grievances and suggestions were brought to light, some of which it was promised should receive full consideration by the District Manager. A lengthy and heated discussion followed this paper. Mr. G. Hooper (District Manager) congratulated both of the members who had given papers, and after a hearty vote of thanks to them the meeting came to a close.

Birmingham Operators.—The second meeting took place on Nov. 12. It was a "Members' Night," the chair being taken by Miss B. Hadley. The subject was "Three Minute Speeches on Given Subjects" by operators, ten of whom took part. The subjects dealt with were operating methods, operating apparatus, and records in connection with operating. The speeches were capitally rendered, and a spirited discussion ensued on points raised. The meeting was enthusiastic throughout, and there was a good attendance.

Exeter.—The first meeting of the session was held on Oct. 27. A paper was read by Mr. H. Reid on "Traffic," the principal points dealt with being efficiency with economy—the proper loading of operators—redistribution—statistics—importance of accurate peg counts—importance of team work—relation of traffic to engineering. Curves and diagrams were introduced showing load in large and small exchanges—calls per line—percentage of operators per load—ratio of load, limited and unlimited services—junction loads—comparative loads per position in large exchanges—the last, and what was thought a very interesting curve, was that showing minimum and maximum calls per day for limited and unlimited services, with relative costs per 1,000 calls per day and per annum. A general discussion ensued and a most enthusiastic first meeting terminated with hearty thanks to Mr. Reid.

The second meeting of the session was held on Nov. 17, a paper being read by Mr. G. E. Williamson on "Underground Work," with special reference to Torquay underground extension. Many points were raised and satisfactorily dealt with, and an interesting discussion closed with a vote of thanks to the lecturer.

East Kent.—The first meeting for the session 1908-9 was held in the Granville Hall, Dover, on Oct. 26, when the Provincial Superintendent (Mr. C. J. Phillips) gave an interesting and instructing paper, entitled "Telephone Reminiscences," illustrated by a number of excellent lantern slides. There was a good attendance of members and friends. At the conclusion of the meeting, the lecturer was accorded a hearty vote of thanks, on the proposition of Mr. H. J. Corke (Local Manager, Folkestone), seconded by Mr. F. J. Duerth (Local Manager, Dover). Mr. Phillips has kindly consented to be president for the session.

Liverpool and Birkenhead.—The second meeting of the session was held on Oct. 22, and Mr. Cohen read his paper on "Transmission." There was a large gathering of members and visitors, the latter including the Provincial Superintendent, Assistant Superintendent, and the District Managers at Barrow, Bolton, Oldham and Preston, and many of the principal officers from the various districts. Mr. Cohen dealt very thoroughly with the subject, and at the conclusion was thanked very heartily by the president, Mr. Hidden, for the lucid way in which he had explained such a difficult subject. Several questions were asked which Mr. Cohen satisfactorily answered. Members present, 94; visitors 20.

Bristol Operators.—The first sessional meeting of above was held on Oct. 22, when a lecture was delivered by Mr. A. E. Coombs, Exchange Manager, on "Traffic Phases." "The Duty Wheel." "Curves, etc." There was an attendance of 90 per cent. available staff, and a most interesting meeting ensued. The District Manager, Mr. A. Perkins, presided.

London.—The first meeting of the fifth session was held at Salisbury House on Oct. 28, with an attendance of 225 members, this being 50 per cent. of the total membership. Mr. H. Davis, the president for this session, who was in the chair, opened the meeting with a brief speech, and then called upon Mr. G. F. Greenham to read his paper entitled "Private Branch Exchanges." The lecturer dealt solely with central battery switchboards, and after explaining in detail the connections of the switchboards, gave figures of current consumption for each class of connection. The various methods of supplying energy to private branch exchanges was gone into fully and some interesting facts regarding supply of current over power leads were given. Some special circuits, such as private lines and long distance extensions on switchboards, were referred to. The lecture was concluded with some figures showing the relative costs of supplying energy by means of power leads, and by charging accumulators at the private branch exchanges, over the exchange lines, when these are disengaged. In the course of the lecture some 25 slides were shown, and owing to the length of the paper very little time was left for discussion, in which Messrs. H. Temple and E. A. Laidlaw took part. Mr. G. F. Greenham suitably replied, and the meeting closed.

Southern (London).—The monthly meeting of this society was held on Oct. 27, when a paper was read by Mr. E. Randell on "The Handling of Faults." The work and qualifications of the fault clerk were well described, and the great interest taken was indicated by the lively discussion which followed the reading of the paper, in which the majority of members participated. The syllabus for the season 1908-9 is as follows:—1908: Sept. 24, "Magneto Exchange Faults," Mr. H. Bines; Oct. 27, "The Handling of Faults," Mr. E. Randell; Nov. 24, "The Deptford Mercury Arc Rectifier," Mr. Inman; Dec. 15, "Induction Coils, Repeating Coils and Transformers," Mr. G. H. Bryant.—1909: Jan. 19, "Common Battery Private Branch Exchange," Mr. P. J. Ridd; Feb. 16, "The Ringing Dynamotor and its Uses," Mr. F. M. Ward; March 23, "Telegraph Circuits," Mr. H. Coupland and Mr. H. B. Howe; April 20, "Line Construction," Mr. F. Hayward.

Nottingham Factory.—The second meeting took place on Oct. 26, 118 being present; Mr. Fenton in the chair. Mr. F. C. Pinder, under the heading of "Metallurgy," gave a lecture explaining the various processes involved in the manufacture of iron and steel. In introducing his subject it was pointed out that at first glance the lecture appeared to have little to do with telephony, whereas it had a great deal, seeing that iron and steel entered so largely into the construction of the various apparatus the workmen were in the habit of repairing, and it was an advantage to know as much as possible of the materials they handled. With the aid of about 40 excellent slides an imaginary journey was then taken through a modern foundry, and the various operations and apparatus fully described. During the discussion which followed a number of questions were asked, and ably replied to by Mr. Pinder.

Warrington.—The second meeting was held on Nov. 11. The District Manager, Mr. H. Chambers, presided over an attendance of 45 members and suggested the formation of a benevolent society for the staff of the district, contending that it would prove of great assistance and help to the men. Mr. H. Clyma delivered a paper on "Switchboards," confining his remarks principally to the "engaged test," as he thought it would rank as the most important amongst the varied class and work of the apparatus connected with an exchange. Mr. W. Beattie read a lengthy paper on "Overhead and Covered Distribution." At the outset he remarked that one's mind could not but be carried back to the history of construction work, and he saw around us relics of those bygone days in the multiplicity of the poles. Re-construction was necessary, after which came the introduction of the vulcanised indiarubber aerial cables. The underground system of cabling was detailed, and it was pointed out how necessary it was to get the most central position, with a minimum of underground lead and aggregate mileage. In dealing with covered distribution, he thought it would be advantageous to use lead-covered cable for leading in subscribers' premises. The lectures were illustrated by means of several diagrams, and interesting and instructive points were brought out in the discussions on the papers.

NEWS OF THE STAFF.

Mr. M. B. STEPHENS, Local Engineer, Enfield, has been appointed Assistant Engineer, Dalston.

Mr. J. H. BOLTON, Local Engineer, Wanstead, has been appointed Assistant Engineer, East Ham.

Mr. H. TALBOT, Assistant Engineer, East Ham, has been appointed Assistant Engineer, Battersea.

Mr. F. E. ADAMS, Contract Officer, Liverpool, has been transferred to Preston in a similar capacity.

Mr. W. M. DOUGLAS, Power Board Attendant, Liverpool, resigned on Sept. 10 to take up a situation in the United States. Before leaving he was presented by his colleagues with a purse of money, as a token of their esteem and goodwill.

Mr. A. HARGRAVE, Contract Officer, York, has been transferred to Hull, taking up similar duties in the Contract Department.

Miss F. M. COWBURN, Hull, has been transferred from Supervisor to Monitor.

Miss E. M. CURTIS, Hull, has been transferred from Senior Operator to Supervisor.

Miss K. JONES, Operator, Birmingham Central Exchange, has been promoted to be Supervisor.

Miss M. GYE, Operator, Birmingham Central Exchange, has been promoted to be Supervisor.

Miss M. C. JINKIN, Operator, Plymouth, has been appointed Travelling and Observation Supervisor for Devon and Cornwall.

Mr. R. YEO, Wayleave Officer for Bristol, has resigned the service, having reached the age limit. Mr. Yeo represented the Company as canvasser from the early days of telephones in Bristol, and is well known in local circles.

Mr. H. APPERLEY, of the Barrow district office staff, has obtained a second class certificate in the ordinary grade of telephony in the City and Guilds of London Institute examination.

Linesman Inspector NEEDHAM, of Leicester, has been transferred to Chester.

Miss M. HERBERT, Senior Operator, Reading, has been appointed Supervisor.

Mr. H. H. BELL, Inspector, Oxford, was presented by the local staff on Sept. 24 last with a silver cigarette box, on the occasion of his being transferred to Chatham.

Mr. N. D. FACER, Switchboard Inspector in Training, and H. CATTON, Junior Inspector at Nottingham, have resigned the Company's service to take up positions under the Government of New Zealand. The operating staff presented them with silver cigarette cases and match boxes, and the male members of the staff gave them leather wallets and dressing cases. The District Manager, Mr. Sibley, made the presentation wishing them, on behalf of the staff, success in their new work.

Mr. J. P. CAVE, Inspector, Tunbridge Wells, has been transferred to Sevenoaks as Inspector.

The many friends of Foreman F. Farrell, of Brighton, will be glad to learn that he has to a large extent recovered from the serious accident which befel him in June last. It will be remembered that his bicycle collided with a truck outside Falmer Station, and Farrell was thrown on his head sustaining severe concussion of the brain. He has now just resumed work after a lengthy illness, and in this connection it may be mentioned that the Gaine Memorial Fund has proved very useful, providing him with three weeks' stay at a convalescent home at Worthing, this being supplemented by the Brighton Staff Benevolent Society with a further three weeks' stay.

Miss CHRISTINA MURRAY, Junior Operator, Kirkintilloch Exchange, has been transferred to Lenzie Exchange as Operator-in-Charge.

London Traffic Department.—*Promotions and Transfers:*

Mr. GUY BUCKERIDGE has been promoted from the Southern Divisional Engineer's office to be Exchange Manager, East, replacing Mr. G. HEAD, promoted to the Engineer-in-Chief's Department, Head Office.

The following have passed their qualifying examinations, and their respective appointments confirmed:—Miss E. EPPS, Clerk-in-Charge, Bromley; Miss K. PRING, Clerk-in-Charge, Sydenham; Miss K. HOOPER, Senior Supervisor-in-Charge, Hammersmith.

Miss J. YALE, Senior Supervisor-in-Charge, Redhill, has, by her own request, been transferred to an exchange nearer her home, and has therefore been made a Supervisor at Holborn.

Miss J. M. CRABB, Operator, Croydon, has been appointed Senior Supervisor-in-Charge, Redhill.

Miss L. GOODWAY, Supervisor, Bank, and Miss F. YORSTON, Supervisor, Gerrard, have been transferred as Supervisors to London Wall.

The Avenue staff presented Miss JOY, on her transfer to Holborn, with a handbag, and Miss F. HARDY, transferred to London Wall, with *Shakespeare's Poems*.

Miss E. SOWERBY, Senior Operator, Battersea, has been promoted to be Supervisor, Streatham.

Miss G. RYDER, Senior Operator, Gerrard, has been promoted to be Supervisor-in-Charge, Palmer's Green.

MARRIAGES.

On Nov. 17 Mr. Gill, on behalf of many of the staff in all parts of the kingdom, and of the Engineer-in-Chief's Department, presented Mr. ARTHUR WATTS with a case of cutlery, &c., on the occasion of his marriage, which took place on Aug. 12 last. Mr. Gill, in making the presentation, referred to the long period he had known Mr. Watts and to the fact that his earliest dealings with him were in connection with a suggestion of Mr. Watts for the introduction of the branching jack system for multiple boards. He also referred to Mr. Watts' characteristic of self-reliance. Mr. Watts, in acknowledging the present, asked the committee to convey his thanks to those of the staff not present, which the committee take this opportunity of doing.

Miss L. M. HOWARD, Monitor, Hull, has left the Company's service to be married.

Miss EMILY M. LOADER, for many years Operator in Bristol, has resigned the service, and was married to Mr. E. L. FRYER, District Office Clerk, Bristol, on Sept. 5

Miss JEANIE DONALDSON, Junior Operator, Clydebank Exchange, left the Cmpany's service on Nov. 5, 1908, to be married. Before leaving she was presented with a dinner service and a set of ornaments by the staff on her exchange.

Mr. W. H. FAULKNER, of the Solicitors' Department, Head Office, was married on Nov. 6, at St. Mary's Church, Islington. On behalf of the staff, Mr. Hart presented him with a case of cutlery.

Miss F. SMITH, the Clerk-in-Charge of the St. Heliers Exchange, was presented by the members of the staff with a complete and pretty dinner service on Oct 21, in anticipation of her marriage. Miss Smith has been in the Company's employ eight and a half years, and leaves the service with the heartiest congratulations of the staff generally.

Miss EDITH BAKER, Senior Operator, Cardiff, has left the Company's service in view of her approaching marriage. Prior to her leaving the operating staff presented her with an electro-plated fruit and flower stand, with best wishes for her future happiness.

Mr. F. L. MYLES, Inspector, Bedford, was presented with a clock, set of framed pictures, china *epergne* and salad bowl by the staff of the Bedford centre on the occasion of his recent marriage.

London Traffic Department.—*Leaving to be married:*

Miss A. WILLIS, on resigning from East Exchange to be married, was presented with an oak tray and specimen vases by the staff.

Miss M. BREWER, Operator, Sydenham, has resigned to be married, and will be taking up her residence in America. She was presented with a gold bangle by the Sydenham operating staff.

Miss S. FOSKETT, on leaving Avenue Exchange to be married, was given a standard lamp by her friends at that exchange.

Miss L. DAVIES, on leaving Kensington, was presented by the staff with a silver rose bowl.

OBITUARY.

We regret to record the death from consumption of Foreman J. HYDE at Brighton on Nov. 8. Mr. Hyde has many friends in other districts outside Brighton, who will be sorry to hear of his demise. At the funeral the Company's staff was represented.

The funeral of E. J. ASHILL, Lineman Inspector, Chippenham, who was found dead on the railway line on Oct. 27, took place at Bristol, where he had previously employed for four years as Fitter and Night Operator. On Oct. 30 two wreaths were sent on behalf of the Chippenham and Bristol staffs, and representatives of the staff attended.

We regret to have to record the death from cancer of Wireman BROWN, who was employed in the Southampton centre for the last three years.

Inspector ROUTLEDGE, Burnley, succumbed to an attack of pneumonia on Oct. 31 after an illness of a fortnight's duration. He had been in the service for seven or eight years, and had through his genial disposition gained the respect and esteem of all departments. He leaves a widow and child. Three of his fellow workers represented the Company, and acted as pall-bearers at the funeral, which took place on Nov. 4. The staff of the centre sent a wreath as a token of respect.

STAFF GATHERINGS AND SPORTS.

Luton.—The members of the staff of the Luton district had the privilege of inspecting the Gerrard Exchange on Oct. 31. The party, numbering about 50, was split into two and, under the able guidance of two of the exchange officials, inspected the switchroom and the various apparatus rooms. The visit was much enjoyed.

Hull.—*Cricket and Tennis Club.*—The annual meeting of the above was held on Nov. 2, Mr. J. T. Tattersall, Local Manager, being in the chair. It was stated that the club had not been supported as in previous years; and the Chairman asked the members present to do their best towards raising the enthusiasm and support of the remainder of the staff, as it was only through their enthusiasm and support that the club could be carried on on a sound basis. The following officers were elected:—President, Mr. C. C. Worte; vice-presidents, Messrs. R. Morgan, A. K. Murray, F. Robson, and J. T. Tattersall; captain, Mr. E. Moore; vice-captain, Mr. J. A. Gomersall; secretary, Mr. G. H. Cobby; treasurer, Mr. G. R. Hill; committee, Messrs. R. W. Barthel, J. E. Greenwood, E. B. Mainprize, J. Ogilvie, C. E. Platts, W. Sanderson and A. H. Sergeant. During the season fifteen matches were played, of which were lost eight, won seven. The bowling honours were carried off by Mr. E. Moore, who scored 30 wickets at a cost of 2·8; and the batting by Mr. F. Hunter with an average of 33·1. This member in one inning scored 106 not out.

Nottingham.—The Operating Staff held their annual dance at the Victoria Hall on Oct. 30. The evening was much enjoyed, dancing being kept up until the small hours of the morning. Among those present were Mr. C. H. Sibley, District Manager, Mr. S. Firth, Superintendent's Office, and Mr. W. Crompton, Engineer-in-Chief's Department.

Portsmouth.—The first "whist drive" of the season was held on Oct. 21 at "The Cadena," Osborne Road, Southsea. Players sat down to 21 tables, and after an exciting contest the winners were:—Ladies' first prize, Miss Ruby Marks, silver photo frame; second prize, Mrs. Schweiger, clock. Gentlemen's first prize—Mr. W. Hooper, gold sleeve links; second prize—Mr. Niner, cigarette holder in silver case.

The second whist drive was held on Nov. 13 at "The Cadena," Osborne Road, Southsea. Twenty-three tables were in use, and after an exciting contest the winners were—Ladies' first prize, Mrs. Denham; second prize, Miss Hole; "Hidden number" prize, Mrs. Wigginton. Gentlemen's first prize—Mr. Stoddart; second prize, Mr. W. Hooper; "Hidden number" prize, Mr. Collett. The consolation prizes were taken by Mr. and Mrs. Pharo. The arrangements were very ably carried out by the committee, Messrs. P. R. Denham, H. C. Hamilton and W. Stanley Coulsell. Mrs. S. J. Smith (wife of the District Manager) presented the prizes on each occasion.

Middlesbrough.—The Company's staff, in conjunction with the recreation club, held their annual dance on Nov. 6 at the Co-operative Hall. The programme provided was greatly enjoyed by the members and friends present, dancing being engaged in until 3 a.m. Messrs. W. A. Nicholson (Local Manager), C. F. Metcalfe and R. W. Shotton ably carried out the duties of M.C.'s.

Edinburgh.—The first whist drive for the season was held on Nov. 2. There were 60 players, including several of the Post Office staff engaged on the inventory work. Miss M. A. Luca, Mr. K. B. Rae and Mr. W. Chandler were the prizewinners.

Liverpool.—*National Telephone Swimming Club.*—On Oct. 29 the swimming season was brought to a successful conclusion with a squadron race, the club's opponents being a team from Messrs. Elder, Dempster & Company. The event proved a most exciting affair, resulting in favour of the National after a close finish. The success which has attended the club all through this, its first season, has exceeded the expectations of the most sanguine of its members and supporters. The handicaps, which took place monthly, were well supported, and have resulted, as the season progressed, in many of the members showing a decided improvement in the natatory art. Squadron races were also a feature during the season, and attracted good attendances on every occasion.

The first gala was held at the Club's headquarters, Cornwallis Street Baths, on Oct. 24, in the presence of a large and enthusiastic throng of supporters. The chair was occupied by E. J. Hidden, Esq., the president of the club, which he congratulated on the exceptional progress made in the season, the first of its existence, and said that in no small measure that success was attributable to the untiring and painstaking efforts of its committee, to the loyal and thorough co-operation of its members, and to the cordial support of the staff. He wished them most heartily all success in the future. Owing to the limited accommodation room could only be provided for some 200 of the club's members and friends, but it is hoped that next season a much larger bath will be secured for

the gala, which will accommodate a far greater number. The gala programme included ladies' and gentlemen's club championships, a diving competition, and clever exhibitions of swimming by Miss Nellie Heaton and Mr. M. J. Warriner of the N.C.A.S.A., both of whom well merited the applause accorded to them In addition much amusement was caused by the comic display given by some of the members of the club. The other events on the programme were keenly contested, and some excellent and exciting finishes resulted. At the conclusion of the gala Mrs. Hidden, who watched the proceedings with great interest, presented the prizes to the following successful competitors:—Misses Finnigan, Martin, Kerridge and Coffee; Messrs. Mullins, H. Johnson, G. Johnson, F. C. Burstall, Chappell, Weaver, McLean, Parry and Qualtrough.

Glasgow.—Encouraged by the great success of last year's dance, their first effort of the kind, the ladies of the Douglas Exchange staff successfully carried through a similar function in the Prince of Wales Halls, Sauchiehall Street, Glasgow, on the evening of Nov. 17. Over 50 couples were present, and admiration for the excellent general arrangements was spontaneous and universal. Mr. Mortimer made an acceptable M.C., and the success of the dance was largely due to his and Miss Mortimer's untiring efforts.

Liverpool.—In response to an invitation from the Birkenhead district a billiard match was played on Nov. 2. Teams of ten aside were selected, and after a most enjoyable and exciting match the Birkenhead team proved to be the winners. The games were very evenly contested, but the aggregate score favoured Birkenhead as follows:—Birkenhead, 919; Liverpool, 910.

Norwich.—On Nov. 6 a whist drive for ladies and gentlemen was held at the Criterion Restaurant. Twenty-nine tables were set, and numerous prizes were competed for. A very pleasant evening resulted.

London.—*National Telephone Chess Club.*—The club commenced its first season on Oct. 6, the headquarters being at "Ye Mecca," 56, Ludgate Hill, E.C. The following matches have been played, and although two losses have been sustained, the committee consider the result very satisfactory:—

			For.	Against.
* Oct. 27.	Engineers' Department (General Post Office)	Away.	4 points.	6 points.
Nov. 3.	Metropolitan Asylums Board	Home.	9½ ,,	4½ ,,
* ,, 12.	General Post Office (North)	Away.	4½ ,,	5½ ,,

* Civil Service and Municipal Chess League (second division).

The hon. secretary, Mr. Robert P. Lowe, of 17, West India Dock Road, will be pleased to hear from any members of the London staff who wish to join the club. The annual subscription is 2*s.* 6*d.*

NATIONAL TELEPHONE PROGRESS.

THE following exchanges have been opened during the month:—Eccleshall (Potteries district), Crowthorne (Thames Valley), Lochmaben (Dumfries), Immington (Hull), Midland (Birmingham), Farnham Common (Thames Valley), and Salthill (Cork), bringing the total up to 1,535; 2,354 stations have been added during the month, making a grand total of 471,324.

The principal *Private Branch Exchange* orders secured during the month are those for North British Rubber Company, Edinburgh, four junctions, two internal and nine external extensions; Palace Hotel, Hastings, twelve stations; Prince of Wales Hotel, Southport, two junctions, twelve stations; Cooper & Nephew's, Berkhampstead, two junctions, thirteen stations; Cartwright & Rattray, Hyde, two junctions, eight stations; and John Barker & Co., London, twenty junctions, 66 stations.

Thames Valley.—Additional underground cables are being laid in Ascot, and between Reading and Caversham. In the latter place the underground work is being extended half a mile to the end of the Albert Road; 3,900 yards of 150-pair and 100-pair cable has been substituted for 52-pair cable in pipe in High Street, Oxford.

Bradford.—The new common battery equipment consisting of three "B" sections and five "A" sections was, with practically no disturbance to the service, brought into use at the above exchange on Monday, Nov. 16. The plant represents an extension of the switchboard by 1,300 lines, on to which the party line subscribers have been transferred. A special feature of the board is that the party line ringing key is dispensed with, and the introduction of a double multiple, whereby it is possible for the operator to ring up any subscriber, no matter on what service he may be, by simply throwing the key in connection with the particular pair of cords in use, into the ringing position. A change of numbers has been necessary—subscriber 1*x* now becomes 4,001, 1*y* 5,001, but although having distinct telephone numbers they still use the same line and call on the same circuit, the connection of the two multiples being effected on the intermediate distributing frame where the "A" and "B" lines of the cross connection wire of the 5,000 multiple are reversed. A great advantage of this method is that any party line subscriber transferring to the measured service need not change his telephone number, an alteration on his calling position only being necessary. A new main frame end and intermediate distributing frame have been erected in the basement, with an ultimate capacity of 12,000 lines, also a thorough up-to-date power plant, consisting of two 20-horse-power motor generators, two ringing dynamotors and a set of chloride cells, with an ultimate capacity of 3,240 ampere hours. The installation of this apparatus has necessitated the conversion of the whole of the old section (with the exception of the party line positions) from 4-volt to 24-volt working, additional equipment having had to be inserted in all calling, answering and operators' circuits.

Cambridge.—It is anticipated that during December the Company will transfer the service from an earth circuit overhead system to the new underground system, and introduce central battery work in lieu of the present magneto system. Commodious new premises have been completed for the purpose of this improvement.

LIST OF AWARDS FOR INVENTIONS, ETC.

	£	s.	d.
O. S. Stiles, antiseptic telephone mouthpieces	0	10	0
E. Gaskell, call by insertion of coin in automatic box	0	10	0
H. A. Smith, transmission allowance curve	3	0	0
D. Kirkwood, fixing instruction card to table instruments	2	0	0
H. G. Bufton, earth clamp S.Z.1	2	0	0
F. M. Ward, lineman's tapper	2	0	0
H. J. Mullins, improvement to number pegs	2	0	0
W. E. Stiles, stripping braiding from covered wire	2	0	0
W. J. Pratt, books of forms for enclosing cheques	2	0	0
A. M. Watts, additional column to 2*a* and 2*b* return	2	0	0
W. E. Weston, measured rate bookkeeping	10	0	0
E. B. Cooper, measured rate bookkeeping	0	10	0
J. Roden, method of dealing with works' orders	2	0	0
W. Glenny, ready reckoner	0	10	0
H. Hincks, testroom records	1	10	0
W. Schnyder, testroom records	1	10	0
W. Benham, card system for dealing with inquiries at monitors' table	2	0	0
A. Speight, grant for obtaining silver medal	4	0	0
W. S. Goulden, grant for obtaining bronze medal	3	0	0
Grants to local telephone societies:			
Cork Telephone Society	3	4	0
Brighton Telephone Society	4	17	0
Dover Telephone Society	4	0	0
Hanley Telephone Society	3	6	0
Luton Telephone Society	5	0	0
London (Western) Telephone Society	4	0	0
London (Southern) Telephone Society	3	19	0

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

THE following grants were made during October, 1908:—

		£	s.	d.
Engineering Department	(*a*)	3	10	0
,, ,,	(*b*)	3	0	0
,, ,,	(*c*)	5	0	0
,, ,,	(*d*)	2	14	0
,, ,,	(*e*)	5	0	0
,, ,,	(*f*)	4	0	0
Traffic Department		3	3	11
Construction Department	(*a*)	3	14	6
,, ,,	(*b*)	3	0	0
,, ,,	(*c*)	3	0	0
Stores Department		3	0	0
Maintenance Department	(*a*)	9	2	0
,, ,,	(*b*)	1	10	0
Head Office	(*a*)	2	14	0
,, ,,	(*b*)	0	10	0

Number of grants made to end of October, 117.
Total amount of such grants, £345 8*s.* 8*d.*

Donations received:

	£	s.	d.
National Telephone Company, Limited	13	12	6
P. P. Kipping, Esq.	1	1	0
Sir Sidney Hoare	0	10	0
S. J. Goddard, Esq.	1	1	0
H. Snowden, Esq.	1	1	0
C. E. Edwards, Esq.	0	5	0
A. Anns, Esq.	1	1	0
National Telephone Company, Limited	4	16	8
	£23	8	2

Number of members at Oct. 31, 2,780.

THE
National Telephone Journal

VOL. III. JANUARY, 1909. No. 34

TELEPHONE MEN.

XXXII.—GEORGE HUNTER ROBERTSON.

MR. GEORGE H. ROBERTSON, the eldest son of Dr. J. H. Robertson, was born at Gourock, Renfrewshire, in 1836, and was educated in Edinburgh.

Desiring to see something of the New World, he paid a visit to Canada in 1853, residing for some time at Toronto and Montreal, where he got a good insight into business methods. He visited many other cities in Canada, traversing what at that time were almost unknown parts of the colony, returning to England in 1854. In conjunction with his younger brother he commenced his commercial career as a cotton broker in Liverpool. Success attended their efforts, and they soon afterwards started a similar business in London, the operations in connection with which so materially helped to give them that position in the business world which they have held ever since.

Recognising the value to the country of the movement which eventuated in the formation of volunteer corps, Mr. Robertson joined the Liverpool Rifle Corps in 1857. He was the second man to be sworn in, and he claims the distinction of being the oldest volunteer in the United Kingdom. On the official recognition of the Volunteers in 1859 Mr. Robertson's regiment became known as the 1st Lancashire, and he then made himself efficient by going through a long course of musketry instruction under General Hay at Hythe. In the same year he received his commission as ensign, was promoted to be lieutenant in December, and captain in February, 1860, while in the December following he was appointed captain-commandant, when he took over the command of the regiment. He received his majority on the formation of an Administrative Battalion in 1867. In connection with the late Mr. Joseph B. Morgan, Mr. Robertson took an active part in the establishment of the first telephone exchange in Liverpool in 1879, and he was one of the earliest directors on the board of the Lancashire and Cheshire Telephonic Exchange Company. Being impressed with the novelty and great possibilities of the telephone, he visited America in 1884 and gleaned all the information he could as to the telephone methods adopted by our American cousins, and shortly after his return assisted in the formation of the Western Counties and South Wales Telephone Company, whose operations at that time were chiefly centred in Bristol, Plymouth and Cardiff. He remained a director of that company until its absorption by the National Telephone Company in 1892.

He also took part in the negotiations which led to the fusion of the three great telephone companies in 1889, and became one of the first Directors of the reconstituted National Telephone Company. Mr. Robertson's unique commercial knowledge resulted in his being chosen by his colleagues to be Chairman of the Works, Contracts and Stores Committee, and for similar reasons when the British L. M. Ericsson Manufacturing Company was formed (in which undertaking the National Company have a large interest), he was appointed a director of that company, and was subsequently elected chairman.

Mr. Robertson's name has been a household word in Liverpool in anything connected with telephones, and the great telephonic business which at present exists in that city is very largely due to the unremitting efforts which he has used from the date of its introduction there. His great abilities are much sought after by large undertakings, and amongst others may be mentioned the London and Lancashire Fire Insurance Company, of which he is chairman, the Liverpool Overhead Railway Company, and Messrs. Peter Walker & Sons, of which he is a director. Mr. Robertson is a Justice of the Peace for Denbighshire, and was High Sheriff of that county in 1905.

In the summer months he resides in the lovely vale of Llangollen, and is the proud owner of the historical residence known as Plas Newydd, a veritable treasure house, for so long the residence of Lady Eleanor Butler and the Hon. Miss Ponsonby, the eccentric and world-wide known "Ladies of Llangollen," who there entertained most of the celebrities of their time.

Recreations: Motoring and art collecting.

Clubs: Conservative, Liverpool; and Oriental, London.

NATIONAL TELEPHONE PROGRESS.

NEW exchanges have been opened at Rownhams (Southampton) and Malone (Belfast) bringing the total up to 1,537; 2,005 net stations were added during November, making a total of 473,297 in all.

Chester.—The Company is engaged in erecting a very handsome building of red brick and terra-cotta to serve as the headquarters of the district, and to enable the present scattered departments to be brought together under one roof. The building has three floors with provision for the stores in the basement. The frontage of the building measures approximately 72 feet and the back 31 feet. The present earth circuit plant in the town will be superseded for central battery, the switchboard being of the No. 1 type. Wrexham, the only other town in the district with single wire plant is in an earlier stage of reconstruction. The Post Office in this case also are laying an underground system, the first spade being turned in the work on Nov. 9.

Birmingham.—The new Midland Central Battery Exchange was opened on Saturday, Nov. 14, with 1,381 subscribers, transferred from the Central Exchange. A description of the equipment will be given by T. Cornfoot and F. G. C. Baldwin in next month's issue.

Lowestoft.—An additional 50-line switchboard has been added to provide for additional capacity.

Bournemouth.—The combined underground and overhead cable scheme for the town of Poole has now been completed. The extension of the underground system at Bournemouth to the Alum Chine district has also been completed, the latter extension involving the erection of a 50-pair cable on a high suspension bridge crossing the chine.

Bolton.—The work of adding two measured rate sections with an ultimate capacity for 1,400 lines to Bolton switchboard is now approaching completion. The sections are equipped for 700 lines, 550 of which are immediately required.

TELEPHONE ACCOUNTS AND THEIR TREATMENT AT HEAD OFFICE.

BY J. W. CAMPION.

"I look down over the farms;
In the fields of grain I see
The harvest that is to be,
And I fling to the air my arms,
For I know it is all for me."—*The Windmill.*

IN the north-west corner of Telephone House, there is an ever-grinding mill which looks over a number of farms dotted here and there throughout the country, with an inordinate appetite for their golden produce; it cares neither for the sowing nor the reaping, and is content with nothing less than a rich harvest all the year round.

The mill is the Accountant's Department of the Secretary's Office, and I thought that some readers of the JOURNAL might be interested to know what is the process by which the thousand and one calls upon the Company's purse are dealt with at Head Office.

When it is remembered that in the construction of new plant the cost of material constitutes about two-thirds of the whole, it may be imagined what a formidable item the payment of suppliers' accounts represents in the finance of the Company, the number of invoices dealt with each month at the present time amounting to about 8,000.

I now propose to describe the final culmination of all those ramifications which take place between the date when the supplier despatches his goods and that upon which he receives the Company's cheque in payment thereof.

Before the machinery is set in motion at this office, requisitions have been made out by the districts and forwarded to the Stores Department, where they are entered in the order books under various headings, such as iron stores, instruments, tools, etc., forming the permanent records which are placed before the works and stores committee for their sanction prior to the official order being sent to the supplier. As a result of such communications a large batch of invoices is delivered to this address every morning, and each item appearing thereon has to be at once verified with the entries in the stores order books as regards the quantity invoiced and the rate charged, so that they may be ready for despatch in the evening to the districts concerned bearing the official stamp of the Secretary's Office "Rate charged correct."

The invoices again reach Head Office as explained in Mr. Barnett's first paper on "Monthly Returns," and upon their arrival in this department they are sorted into alphabetical order, then under the names of the contractors in date order; so that each individual account can be agreed with the monthly summary of invoices received from the supplier. Cash discount is next deducted, and an endorsement is made on a covering form giving name, amount and short particulars of the goods purchased. The invoices having been fastened to the endorse, the particulars after certification are entered in a book called the "Payments passed by Board" book. Each entry is numbered consecutively for reference, and the corresponding number is entered on the endorse. This book gives the following details for the information of the finance committee:—Date and number of cheque; number of voucher; name, amount, nature of purchase.

Accounts for underground work are received from the Engineer-in-Chief after certification by him; railway wayleave accounts arrive from the General Superintendent's Department; passenger traffic warrants are forwarded direct from the railway companies each month along with a summary showing the centre and the sums incurred for locomotion expenses. The freight accounts, which number some 3,000 monthly, for conveyance of the Company's stores from the contractor's works, etc., are also paid from this office, ledger accounts being opened with the railway companies and a monthly settlement effected.

In the case of accounts for underground work and wayleave rentals, it is a straightforward task of placing the amounts in the cash books under the respective headings, then making the necessary journal entries when the various items are cleared from our books and charged out to the districts which have incurred the expenditure.

The railway warrants for passenger traffic number about 15,000 each month. They are first checked with the statement from the railway company, then sorted into districts prior to being despatched with a printed letter asking for credit notes from the various centres to which they refer, in order that the expenditure may be correctly allocated through the monthly returns. When the credits are received it is necessary to summarise them under the name of each railway company to ensure the various items being in agreement with the totals in the Head Office books.

The total of the cheques drawn at each meeting is entered in the bank balance book, being allocated under the respective banks upon whom the cheques have been drawn; the vouchers themselves are written up in the cash book under the various ledger accounts and a reconciliation is then arrived at. The expenditure having been sanctioned, the letters and envelopes are prepared for the disposal of the cheques along with the statements showing how the amounts are made up.

The statements are returned to this office to be again fastened up in the endorse so that the complete account may be filed away in alphabetical order for reference, and at the end of each half-year they are transferred to a large box to make way for those referring to the next six months.

From this brief sketch, which of course is not a comprehensive *resumé* of the work of the Accountants' Department, may be gained some idea of the enormous amount of work entailed in dealing with the volume of accounts which pour in daily from the various sources for settlement; the gathering in of the many threads to fashion the complete material; the watchful scrutiny of every item to prevent the possibility of error in payment, or even what is not impossible where so many suppliers and supplied are involved, duplicate payment; and the promptitude and accuracy which the frequent distribution of large sums of money demands—all require an expert staff of a high standard of efficiency, and I trust that I may be pardoned in claiming for the department in this respect the possession of the qualifications necessary for the successful issue of its duties.

AUXILIARY SIGNS FOR CALL OFFICES.

By A. WARD, *Stores Department, Head Office.*

MR. STEVENS has, in his article in the November JOURNAL, called attention to a very important aid to the development of the telephone and one which does not seem to have received much attention. In London suburbs a great number of the residents are ignorant of the nearness of the call offices and the consequent usefulness of the telephone service, owing to the call office signs not having been sufficiently displayed. Only a few days ago the writer had occasion to direct a friend to a call office, although he had been residing for some two or three years not more than 50 yards away from it.

For the sign to be displayed only just outside the call office must very much restrict its effective area, as Mr. Stevens has stated. The fire authorities in London seem to have grasped this point in connection with fire alarm posts, as in a number of thoroughfares now may be seen a large red hand pointing the way to the fire alarm.

Was not a call office in every block the late General Manager's motto? Unfortunately he has not lived to see his hopes realised, and as perhaps it may be years before this is achieved, may not the motto be amended to read "A call sign in every block"? To bring the sign constantly before the sight of the passer-by will insidiously instil a closer acquaintance with the possibilities of the telephone service.

The usual type of sign does not effectively meet the necessities. At present a person standing 50 yards away from it is unable to say to what it refers, as owing to the distance the sign cannot be easily read, and its outline does not indicate its purpose. The man in the street obtains his information more and more like his ancestors who imbibed their knowledge from signs and picture writings. The present day advertisers appreciate this fact, as a reference to the bill hoardings will show.

Material and design of bell as per present standard sign. Bell stamped out with initial T cut away

Colour, bright signal red, enamelled both sides.

Indicator.—An arrow bolted to foot of sign by means of lugs left when punching out, enabling it to be fixed in any required position.

From the writer's observations the sign required should at least comply with the following points:—(1) Its shape should enable it to be readily distinguished by its outline. The square plate with the bell sign printed on it loses, owing to atmospheric influences and to the distance, all significance. It is merely a square plate with some inscription on it—one amongst many others of similar shape. With the plate cut away to conform with the sign one can see at a glance what it means to convey.

(2) The colour should be striking, and one not easily obliterated or hidden by atmospheric influences, and also one not too generally adopted by other advertisers. Blues and yellows are already used by almost all classes of advertisers. For this reason alone either of these should not be chosen. The most striking of the primary colours is without doubt red or scarlet. How easily the wild red poppy is picked out in a field, and how quickly the fire alarm and pillar post boxes are seen at a distance! Look down a street and notice how a small piece of scarlet geranium in some window box will force itself to one's notice. Scarlet would certainly appear to be the colour required.

(3) It should be easily adapted for a variety of positions—*i.e*, hanging in windows, fixing flat to walls, hanging from street brackets, attached to lamp posts, etc., etc.

(4) It should possess some means of indicating the whereabouts of the call office.

Lastly, it should be easily manufactured at a small cost.

Hence the sign would appear as shown.

Such a sign displayed at suitable points would instantly arrest the notice of the passer by and induce by suggestion the more frequent use of the telephone service. Its shape would enable one to recognise it a long distance away in almost any light. Its colour would force it to notice. The results of fog and dust would not blot out its identity. By its means the call office would become more widely known, and this would help forward the time when the telephone service is recognised as as great a necessity in household life as gas or water is at the present time.

"TELEPHONE MANNERS."

[*Reproduced by the courtesy of the* DAILY MIRROR.

THE Postmaster-General has issued orders to telephone operators in his employ to be polite to subscribers. We should esteem it a favour if he would also teach manners to the subscribers themselves. Many telephone users are not only rude to the telephone employees, but inconsiderate to those whom they call up, often keeping people waiting many minutes while they find themselves. There is too much of the "hold-the-line-he'll-be-here-in-a-minute" nuisance.—(*Daily Mirror.*)

ROTTERDAM TELEPHONE EXCHANGE.

BY W. M. FRANCE, *Engineer-in-Chief's Department.*

(*Continued from page* 184.)

THE connections of the transfer circuits and of the multiple position selecting lamps are shown in Fig. 3. The principle on which the transfer circuit is designed is the same as that shown in Fig. 2 with the addition of the extra signalling arrangements necessitated by the answering and calling cords being located on the distributing and multiple sections respectively.

The complete operation of the circuits is as follows:—

When the subscriber removes the hand micro-telephone set from its rest the line relay (Fig. 1) is operated and the calling lamp at the distributing section is lit in the manner already described. To answer the call the distributing operator selects a plug in connection with a non-busy multiple operator's position having all the white lamps associated therewith alight, and lifts it from its socket. Relays A and B are thereby operated—the former through the earth on the socket contact T, the armatures and outer contacts of relays D and K to battery, and the latter through the armature and inner contact of relay A. The operation of these relays cause all the white lamps associated with this multiple operator's position on each of the distributing sections to be extinguished, indicating thereby that this particular operator is busy. As soon as the distributing operator inserts the plug into the calling subscriber's jack relay C is operated by means of battery in connection with the subscriber's line *via* the ring of the plug, spring 1 of the listening and ringing key and the armatures and outer contacts of relays J, F and H. The operation of relay C causes the calling lamp (S) to light on the multiple operator's position, and the multiple operator, observing this, throws the corresponding listening key and ascertains from the calling subscriber the number required.

It might here be noted that when the listening key is moved into the listening position springs 1, 2, 3, 4, 7 and 8 break from their inner contacts and make connection with the outer contacts, and when moved into the ringing position springs 5 and 6 only break from their inner contacts and make on the outers.

As soon as the key is thrown into the listening position relays E and D are operated, the former through spring 8 and outer contact and earth on the socket contact T, and the latter through spring 7 and outer contact to earth. Relay D is also retained through its second winding, armature, inner contact and the earth on the socket contact T.

The operation of relay D cuts earth off relay A which causes the latter to be released and thus breaks the circuit of relay B. The armature of relay B when released connects earth through the armature and inner contacts of relay E to all the green lamps associated with this multiple operator at the distributing positions and causes them to light.

The armature of relay C is also released when the key is thrown into the listening position owing to spring 1 breaking from its inner contact, and the calling lamp S on the multiple operator's position is thereby extinguished.

The multiple operator after testing the required subscriber's jack and finding it disengaged inserts the calling plug. This causes relay F to be operated through the bush of the called subscriber's jack (Fig. 1) 100-ohm register coil, and 500-ohm cut-off relay to earth. Relay F when operated completes, through its lower armature and inner contact, the circuit of the supervisory lamp O associated with the calling cord, and causes it to light. The operator then throws the key into the ringing position and the subscriber's bell is rung for three or four seconds, the key being held over in the ringing position by means of a dash pot device in connection therewith. As soon as the ringing key is thrown relay G is operated by the generator current through its 35-ohm winding, the outer contact on spring 5 of the ringing key, the subscriber's line and the outer contact of spring 6 of the ringing key to earth. The relay G when once energised is retained until the required subscriber answers, through its 400-ohm winding, lower armature and inner contact, and also through the lower armature and inner contact of relay F. The lower armature and outer contact of relay G when operated breaks the calling supervisory lamp circuit O, which causes the light to be extinguished, and its top armature and inner contact connects earth to the sleeve of the answering plug at the distributing position through the outer contact and middle armature of relay H, key L and relay M, thereby causing the register associated with the calling subscriber's line to be actuated and a call recorded. Relay M in the same circuit is also actuated, and its operation causes the register lamp to light and a call to be recorded on the operator's register. During the time the subscriber's register is operated a tone test is connected to the subscriber's line through the 3,400-ohm resistance, the armature and inner contact of the subscriber's register, Fig. 1.

When the subcriber has once been rung, and until he answers, the red lamp N associated with the calling plug is lit, its circuit being completed through the lower armature and inner contacts of relays F and G. The object of this lamp is to indicate to the multiple operator that the subscriber required has been rung but has not yet replied. At the time the key is moved from the listening to the ringing position the circuit of relay E is broken through spring 8 and its outer contact. This causes all the green lamps associated with this multiple position on the distributing sections to be extinguished and the corresponding white lamps to light, indicating to the distributing operators that this multiple operator is free to take another call. Immediately the ringing key restores from the ringing position to the normal position, relay H is operated by means of the battery on the subscriber's line relay, *via* the ring of the calling plug, Nos. 5 and 3 springs and inner contacts of the ringing and listening key, the middle armature and inner contacts of relay G and the socket contact V to earth. This cuts the register out of circuit. It should be observed that relay H is retained through its lower armature until the plug is restored to the socket V; the object of this being to keep the register out of circuit and so prevent a second call being registered should the operator find it necessary to ring the required subscriber a second time.

As soon as the called subscriber answers, relays F and G become de-energised, the former owing to the battery being connected to the sleeve of the calling plug through the armatures and inner contacts of the called subscriber's line and cut-off relay, the 100-ohm winding of the subscriber's register and the bush of the jack; the latter through its circuit being broken at the lower contact of relay F.

During conversation all lamps remain extinguished and the only relays associated with the cord circuit which are energised are H and D. When the calling subscriber replaces the hand micro-telephone on its rest relay J is operated owing to the line relay being released and cutting battery off the sleeve of the plug, this causes the supervisory lamp P to light, the circuit being completed from the lower armature and inner contact of relay J, the outer armature and inner contact of relay H to earth. As soon as the called subscriber returns the hand micro-telephone to its rest, relay F is operated in a similar manner to relay J. This causes the calling supervisory lamp O to light. When both supervisory lamps P and O are alight the supervisory pilot Q also lights. When the multiple operator observes both supervisory lamps alight she withdraws calling plug from the subscriber's jack. thus causing relay F to become de-energised and the supervisory lamp O to be extinguished. As soon as the plug returns to its socket contact V the circuit of relay H is broken and it becomes de-energised; its top armature breaks the circuit of the supervisory lamp P, and at the same time the top contact of relay H completes the circuit of the clearing lamp which lights on the distributing position. The distributing operator on observing the clearing lamp alight withdraws the answering plug from the subscriber's jack, thus breaking the circuit of relay J, the middle contact of which breaks the circuit of the clearing lamp R. The answering plug, returning to its socket, breaks the circuit of relay D, thus restoring the whole of the apparatus to the normal position.

The two outer single keys shown immediately below the combined listening and ringing keys are provided to enable the operator to speak on either cord separately without a subscriber on the other cord overhearing. The middle key is to enable the operator to ring back. As far as could be ascertained these keys are seldom used.

Key L is provided to enable the operator to break the register circuit and so prevent the call being recorded should necessity arise.

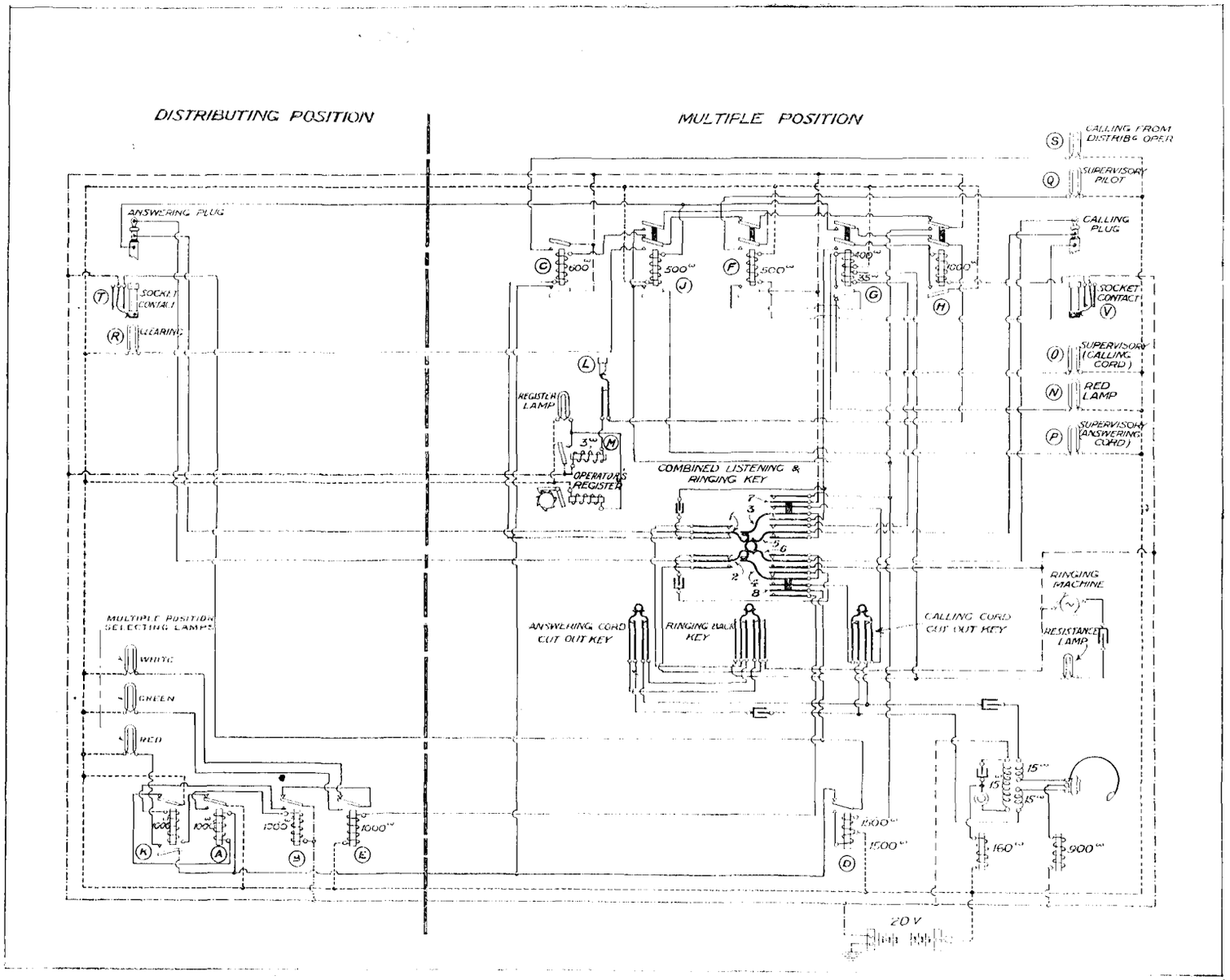


FIG. 3.

The circuits described show the main differences between the circuits installed at Rotterdam and those in use by the Company, and it is hoped that these will enable the reader to follow the differences in the method of working.

It is regretted that no figures can be given of the working costs as at the time of my visit, the whole of the equipment had not been brought into use, and some of the lines were still working on the old magneto equipment. Therefore, no data was obtainable which would enable a comparison to be made between this system and that of any other.

While the ultimate analysis of the above system cannot be made without detailed consideration of costs yet it is possible to make a first analysis without such figures and to see from this what are the factors needing consideration and in what directions they tend to operate.

Some of the main plant and operating factors to be considered are:

Plant.—

(*a*) Reduced intermediate distributing frame.
(*b*) Reduced multiple equipment.
(*c*) Two distinct groups of positions and the necessary internal signalling apparatus between them.

Operating.—

(*d*) The claim that each of the two groups of operators can take a higher load than on the ordinary equipment.
(*e*) The supervision is divided into two groups.
(*f*) The operators cannot recognise who is calling, and consequently cannot differentiate between various services; this means that all lines are entitled to the same service and that calls made from these must be recorded in the same manner.

In order to prove in the system, the analysis also requires that for any given degree of service the load taken by the operators as a whole shall be so much greater than in the case of the ordinary equipment, so as to pay for the increased annual cost for apparatus, if any. Whether or not this is achieved in any particular place is obviously a matter of local costs, and no general rule can be set up.

As regards the operators' load, it is understood that in a town almost entirely served by one exchange a distributing operator may be expected to handle 1,000 actual calls during the busy hour, and a multiple operator 300, actual calls during the same time; thus, for 3,000 calls in the hour, three distributing operators and ten multiple operators would be required, making a total of thirteen operators, excluding supervisors, etc., or an average load of 231 actual calls per position.

This does not indicate that any large, if any at all, saving is likely to be effected in the operating cost, and indeed it is because the costs have not warranted it in this country that the system has not been adopted here although studied many years ago.

THE TERRITORIAL FORCES.

WITH SPECIAL REFERENCE TO THE ELECTRICAL ENGINEERS (LONDON DIVISION).

BY W. H. GRINSTED *(Sergt. E.E.L.D.).*
Engineer-in-Chief's Department.

IT has suggested itself more than once to the writer that if the different electrical engineering corps of the Territorial Army were better known among the technical staff of the Company considerable interest might be aroused and a number of first-class recruits obtained. A description of the work of these corps may also prove interesting to other members of the staff.

To begin with the Territorial Army in general; there is a strong element of patriotism in the new force, for the "territorial" has a feeling that he is recognised as a useful member of an organisation which forms a really essential part of the country's defences. Indeed, the corner stone of the scheme is active personal patriotism, the conviction that each individual should take a personal part in the affairs of the nation, an entirely different thing from that sentimental patriotism, which for the most part consists in abusing our opponents, singing jingoistic songs to our own glorification and leaving all the work to Tommy Atkins.

The advantages afforded by training in the Territorial Army are not realised by those who are not members. The military side, the drill and discipline provide physical exercise and cultivate alertness, self-possession and self-control. Later on, as the soldier is promoted, he has opportunities of practising organisation and of developing the power of control over others. All these are qualities which have a real value in securing success in life. The technical training given by the corps to which this article particularly refers, lends the interest which the energetic engineer or electrician demands in everything he takes up. To a telephone man the work is specially attractive, since, in addition to affording scope for the exercise of his specialised knowledge, it gives him a really practical acquaintance with heavy current work, and with the operation of steam

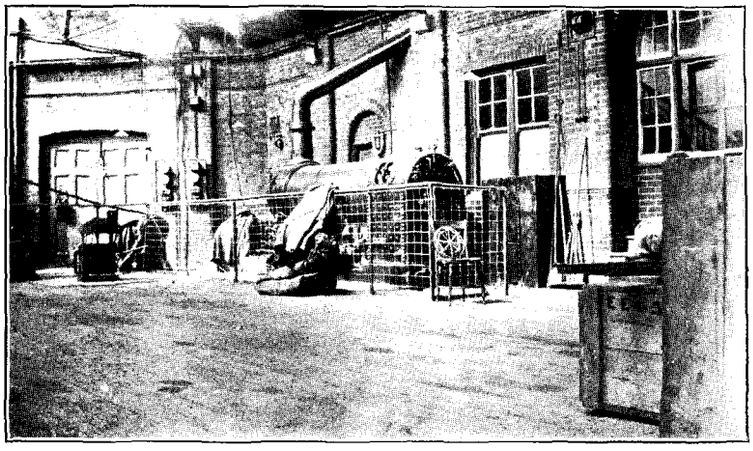


FIG. 1.—HEADQUARTERS: THE ROBEY STEAM ENGINE.

and oil-engine plant, worth more than any amount of information gained from text books.

But the immediate personal advantages are not the greatest. There is the solid satisfaction that comes from a duty fulfilled, for there can be no doubt that military service is now one of the duties of every able-bodied Briton. This is proved by the action of other countries in enforcing this service. Britain has always relied, and always will be able to rely, on its citizens' honour. The response obtained during the South African War shows that the spirit is not lacking when need arises. But why wait for war? Who will be better able to render useful service, better able to defend his country, not to say his own person, the raw hand who has just joined or the man who has been in training for some years? As for those who neglect this duty and, when the occasion arrives, find themselves unfit to help, their lot will be one of well-deserved contempt. With unbearable shame they will watch others going out to their duty as men while they, able-bodied and fit but untrained and incapable, are obliged to remain behind with the women and children.

Many people have an impression that the obligations and restrictions imposed on a man enlisting in the Territorial Army are much more serious than in the old Volunteer force. In the Electrical Engineers, at any rate, there is very little difference, and the obligations are particularly light. The amount of training insisted upon is less than in any other branch of the service. A man enlists for four years; should there be any genuine reason preventing him from completing his term of service he will be granted permission to withdraw, the only object of the condition

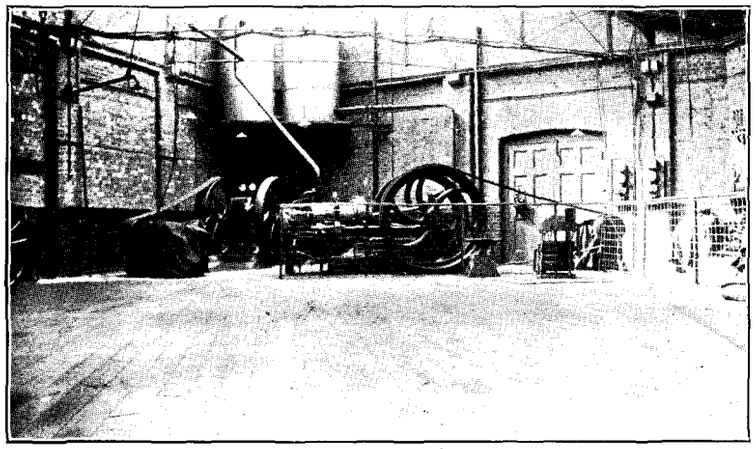


FIG. 2.—HEADQUARTERS: TWO 25 HORSE-POWER OIL ENGINES.

being to secure men who are really in earnest. During the first year he is required to attend eighteen drills of one hour's duration, and the annual training of eight days in camp. Each year after the first only six drills have to be performed in addition to the camp training. As many as three drills can be put in at once, so the required attendance amounts to only six evenings in the first year and two evenings in subsequent years. If he desires, a man may extend his training at camp to fifteen days, but this is quite optional.

Uniform and equipment are provided free. There is no entrance fee or any other expense.

The Electrical Engineers (L.D.) provide detachments to man the searchlights used to detect night attacks on defended ports, and to light up the enemy's vessels for the gunners in the batteries above. Each of the large arc lamps used in the searchlights is supplied with current by a separate dynamo, and each dynamo is driven by a 25 horse-power oil engine. The current taken is from 120 to 150 amperes at 60 volts, so that between the tips of the carbons, where the arc is formed, energy is being transformed into light and heat at the rate of 12 horse-power, all in a space of less than 1 cubic inch. The light produced is so intense that it is dangerous to allow it to fall on the naked eye and all adjustments have to be made with the help of a special glass screen. The candle-power can only be roughly determined; it is in the neighbourhood of 40,000. Every man in the corps is trained to run the engine, dynamo and searchlight, and to make repairs on any part.

Instruction goes on at the headquarters in Regency Street, S.W., on four nights a week. The recruit is taught the usual military squad drill and rifle exercise for the first hour of his parade night, and then has two hours' technical instruction. He is taught the principles and the method of running oil and steam engines, and gets plenty of practice in starting up, stoking and making adjustments. On the electrical side he learns the theory and operation of dynamos, large arc lamps and the auxiliary apparatus, the properties of different mirrors and lenses, and is made capable of taking charge of a light and keeping it going under all conditions. The technical work is done in small, free and easy classes of three

or four men and the theory and principles of all the apparatus are specially explained. For men who are not familiar with it, instruction in elementary electricity is given.

Every member of the corps is also taught the working of the military telephone systems such as are fitted in the coast defence stations. Signalling classes are held regularly, and the men arrange frequent week-end practices in the country among themselves. Knotting and splicing is not the least useful subject in which instruction is given. A miniature rifle range with free ammunition is open for practice every parade night.

The plant installed at the headquarters consists of two 25 horse-power Hornsby-Ackroyd oil engines, one 25 horse-power Robey steam engine, and three fully equipped coast defence searchlights. All this plant is run by the members undergoing instruction every company night. The engine plant is seen in the accompanying photographs. In addition, except when they are required by the regular forces, the corps has the use of two field searchlights supplied with current by dynamos driven by small Daimler oil engines. The engines and dynamos are mounted for transport in what are unofficially known as "stink-vans" on account of the penetrating aroma of the exhaust gases.

Week-end trainings are carried out on the Thames defences during the winter and spring. These runs are specially intended to give recruits an opportunity of working under service conditions. Attendance is entirely optional, but counts towards the number of annual drills.

The most important training is, of course, the annual camp. Some people seem to have the impression that the citizen soldier has none too good a time in camp; they hint that he is overworked, underfed, uncomfortable, and even bullied. The soldier's own opinion is almost without exception the absolute opposite. Ask any Territorial whose opinion is worth having and he will tell you that his camps are the most thoroughly enjoyable holidays he has ever spent. Fresh air for 24 hours daily, an enormous appetite and plenty of wholesome food to satisfy it, enough work ro prevent the time hanging and enough leisure for his own amusements, healthy, sturdy fun and true sociability stand out among his recollections of

FIG. 3.—OFF DUTY AT CAMP.

camp life, and are contrasted involuntarily with insipid, lazy and inevitably boring holidays spent at some crowded seaside resort. One cannot imagine a more complete change from the life of the exchange or office, and a less expensive holiday is not to be found. Free quarters, food and clothing are provided, and the camp pay, which for engineers is 1*s.* 5*d.* per day and upwards, provides pocket money. The Electrical Engineers are particularly fortunate in their camps. From the nature of the work camps must be formed by the sea, and since only a limited number of men can be trained on the plant at one station, the camps are much smaller than in other corps. The advantages of the first condition are obvious; the second increases the sociability and, further, makes it necessary to spread the period of training over a large part of the year. Camps are held from the beginning of June till the end of August, so every member is able to select a week that suits his convenience. It is scarcely necessary to remind readers that the Company extends the annual leave up to 21 days to men in the Territorial forces.

A typical day in camp begins with "*reveillé*" at 6 a.m., followed by an hour of infantry drill, just to sharpen the appetite for breakfast, which is ready at eight o'clock. Then follows a working parade for instruction purposes from nine till twelve, and dinner at one. The afternoon and evening are free until about eight o'clock, when the "fall in" sounds for a night run. The different parties are marched off, and the lights are kept going till the order comes to shut down, generally about eleven o'clock; then a short march back to camp, and everybody turns in for a sound and well-

FIG. 4.—AN ARMED PARTY.

deserved sleep. It is usual to sound "*reveillé*" an hour later on the day after a night run, and to replace the evening duty by an afternoon parade.

In addition to the coast defence work, the Electrical Engineers have done pioneer work in connection with the use of searchlights in the field, and in a few years' time when the local Territorial companies which are being formed are established, the corps is to turn its attention to general electrical and mechanical engineering in the field. It is not safe to prophesy, but the addition of field work to its duties will probably involve the use of motor searchlight waggons and other motor-driven equipment.

The conditions and work in the local companies mentioned above are similar to those in the London Division, and if any member of the staff in a town where such a unit is being formed thinks of joining, let him not hesitate another moment, but apply at once to the local sergeant-instructor.

If any reader desires further information as to the London Division the writer will be very pleased to furnish it, or he can obtain full particulars by writing or calling at the headquarters, Regency Street, S.W.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

The following grants were made during November:—

Maintenance Department	(*a*)	£9	6 0
,, ,,	(*b*)	2	0 0
Engineers' Department	(*a*)	3	0 0
,, ,,	(*b*)	7	10 0
,, ,,	(*c*)	2	13 6

Total number of grants made since formation of society, 122.
Total amount of such grants, £369 18*s.* 2*d.*
Amount of subscriptions received during November, £12 15*s.* 7*d.*
Donations received:

A. E. Cotterell, Esq.	£0	10 6
C. B. Clay, Esq.	2	2 0
H. Davis, Esq.	0	10 0
Do.	0	0 2
C. J. Phillips, Esq.	0	10 6
National Telephone Company, Limited	13	17 0
L. Harvey Lowe, Esq.	0	10 6
Wellwisher, T. B.	0	10 0

Members added, 70.
Members ceased, 54.
Number of members at Nov. 30, 2,796.

THE NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION.

THE POST OFFICE AND THE STAFF.

By W. R. BOLD.

As I have shown in my previous articles, the staff, through its association, claimed that all members of the staff employed by the Company at the date of transfer should be taken into the service of the Postmaster-General in such a manner as to prevent loss, and be given the benefit of their past services. Also that all those in receipt of a salary of £100 or upwards, or who occupied a post or office which, if occupied in the service of the State, would entitle him or her to a superannuation allowance, should be placed on the permanent establishment of the Post Office so that their service would count for superannuation purposes.

The Select Committee on the Post Office (Telephone) Agreement, 1905, although they took what to my mind was a very limited view of the terms of the reference regarding the staff's case, practically accepted and endorsed the staff's claim save that they made no recommendation, the staff being given the full benefit of its past services.

If these recommendations had been accepted by the Postmaster-General the only important principle outstanding would have been the recognition of the staff's past services in full, but has the Postmaster-General accepted the recommendations?

On Aug. 9. 1905, the Committee's report and recommendations as to the staff were the subject of a debate in the House of Commons, and the then Postmaster-General (Lord Stanley, now the Earl of Derby) stated that he "thought the report of the Committee was not at all extreme and he was glad to be able to give a consent, *modified only by certain alterations which were absolutely necessary to make the scheme workable*, to their recommendations," and proceeded to read to the House a memorandum setting out "the terms which the Government were prepared to give to the employees who came into their service."

These terms may be summarised as follows:—

(1) To take into the service of the Post Office all officers and servants (except officers in receipt of £700 per annum or upwards) who on Dec. 31, 1911, have been not less than two years continuously in the service of the Company, such officers and servants to enjoy the advantages and to be subject to all the conditions of the rank or grade to which they are admitted.

(2) To allow those officers or servants who have been in the Company's service continuously since Aug. 15, 1904, and who are placed on the Post Office established staff to count their actual services with the Post Office for pension purposes although they may retire before they have served ten years in the Post Office.

(3) To allow those "officers" not on the Company's Pension Fund who are placed on the Post Office established staff to add for pension purposes two years to their actual service with the Post Office.

(4) To dispense with a medical examination save in cases of officers and servants who have had an abnormal amount of sick leave between Dec. 31, 1909, and Dec. 31, 1911.

(5) Officers and servants who are on the Company's Pension Fund and are taken over on the established staff of the Post Office, and who will lose in pension by reason of the transfer, may have two years added to their actual service with the Post Office, if it is proved that the general body of the participants in the Company's pension scheme will be placed in a substantially less favourable position.

(6) To provide for these arrangements in the Act necessary to provide the purchase money.

Lord Stanley having read this memorandum, proceeded to state that "he thought the honourable members would see that the Government had very *fairly* and *generously* met the whole of the suggestions with regard to the employees made by the Committee," and later on, in reply to questions raised on behalf of the staff, said that "the employees would be transferred to equivalent work for equivalent pay."

It will be seen that, even if the terms of the memorandum are carried out in the most liberal spirit possible, they did not meet or cover at least two of the recommendations made by the Select Committee, inasmuch as—

(1) The medical examination was not waived altogether, as recommended.

(2) Considerable loss may arise to members of the Company's Pension Fund even if two years are added to their actual service with the Post Office.

With regard to the question of a medical examination, Lord Stanley explained that if a member of the staff, who had had an abnormal amount of sick leave between Dec. 31, 1909, and Dec. 31, 1911, failed to pass such an examination he would not be placed on the established list of the Post Office, but the Post Office would "endeavour" to take him over on the unestablished list.

I cannot understand in what manner or for what reason the refusal to waive the medical examination altogether, and the condition that the members of the Company's Pension Fund are not to have two years added to their actual service with the Post Office, unless it is proved that the general body of the participants will be placed in a substantially less favourable position, can be justified as being "alterations which were absolutely necessary to make the scheme workable," nor are these terms, to my mind, in any way consistent with, the statement that "the Government had very fairly and generously met the whole of the suggestions . . . made by the Committee." Apart from the fact that the Select Committee recommended that all question of a medical examination should be dispensed with, it would be a grave injustice to a man after many years of service in a business requiring considerable special training to deprive him of the position he had acquired by long and arduous work and, possibly, his rights to a pension simply because he might be unfortunate enough to break down somewhat in health during a certain specified period. In accepting a recommendation that no one is to suffer loss, and that the pensionable officers of the Company are not to have their pension rights prejudiced by the transfer why, having given the benefit of two years' past service to other officers, hedge round the grant of the similar benefit to pensionable officers in the manner above described. Was that a fair and generous way of accepting the Committee's recommendations?

So far I have taken it that the terms granted by Lord Stanley will be put into practice in a liberal spirit, such as was understood by the House, but it is somewhat regrettable to have to record the fact that although Mr. Sydney Buxton (Postmaster-General) has already confirmed Lord Stanley's undertaking in general terms the Post Office officials have, so far, been unable to help the Central Committee of the Staff Association by confirming the fact that those members of the staff who can only be given equivalent positions in the Post Office by being placed on the established list will not be asked to pass any sort of educational examination. The intention of the Select Committee and Lord Stanley on this point is perfectly clear, and as a great deal of harm will be done if the staff have any reason to think that the terms granted by Lord Stanley (which are not satisfactory even if acted on in a very liberal spirit) will be departed from to the detriment of the staff, it is trusted that the Post Office will take an early opportunity of putting the matter right.

The main issue is the question of past services. The Post Office have recognised that the Company's staff ought to have some consideration owing to its services with the Company, inasmuch as they have agreed to waive the ordinary Civil Service rule which requires a Civil servant to have ten years' service before qualifying for a pension, and have also granted the benefit of two years' past service.

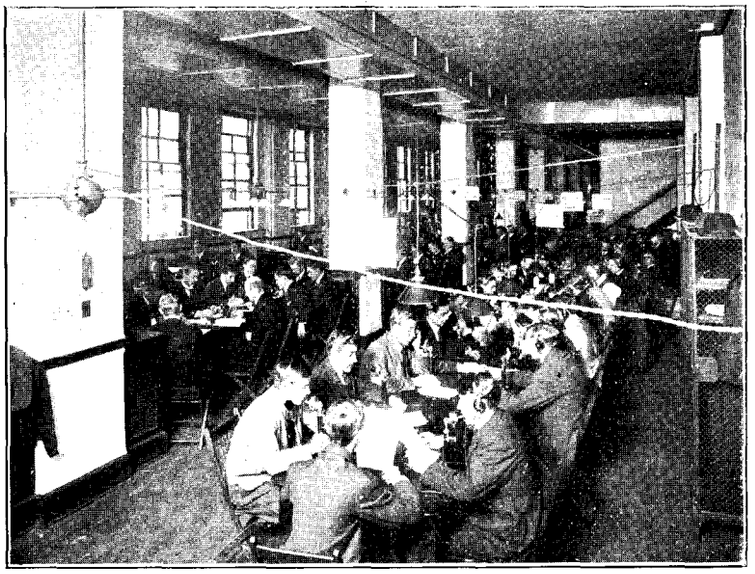
In a previous article I have endeavoured to explain some of the reasons why the staff claims that its past services shall be recognised in full, and there is no doubt that the staff as a whole is, rightly or wrongly, fully convinced that its claim is a perfectly proper and just one, and will never be satisfied until the claim has been settled as has been done in the past in other cases of staffs being transferred.

The Post Office having recognised that the staff is entitled to some consideration in respect of its past services, I would submit that, apart from other considerations, they would be acting in the best interests of the telephone service and as befits a great Government department by granting the staff the full benefit of its past services, and so securing on the transfer of the Company's plant not only a loyal staff but also an enthusiastic and contented one.

TELEPHONING PRESIDENTIAL ELECTION RETURNS IN CHICAGO.

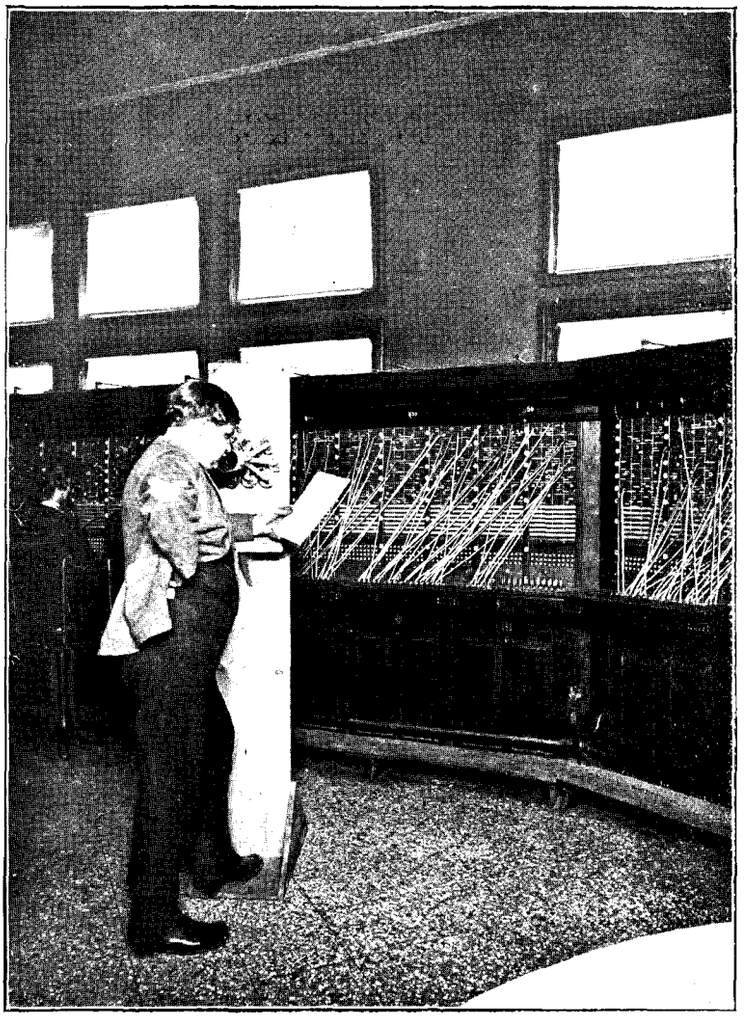
THE preparations for transmitting election returns by telephone were more elaborate this year than ever before. The American Telephone and Telegraph Company (long-distance company) established headquarters in each of the States reached by its lines, and this now means practically all the States east of the Rocky Mountains. At this point the State returns were gathered and transmitted direct to New York. The returns were there compiled and sent out again all over the country by the long-distance wires in the shape of brief bulletins telling the principal features of the results on an up-to-the-minute basis. As the information was generally confined to a few of the principal candidates the results were quickly compiled, and reached the entire country perhaps in a shorter space of time than any similar bulletins ever sent out.

In the large cities special arrangements had been made to gather the returns quickly, and transmit them by telephone. In Chicago, by arrangement with the City Press Association, returns from the city precincts were telephoned to the Main Exchange compiling office as soon as they were received at the City Hall.



Similar means were provided for gathering news in the various counties around Chicago, and this was made up into brief bulletins for local distribution and also transmitted to New York.

The Chicago Telephone Company has for many years distributed election news to telephone subscribers generally, as well as to newspapers, clubs, and public gatherings. This year the demand for the service was greater than ever before, and preparations for the bulletin transmission were necessarily more elaborate. An entire floor of the company's new toll building at 87, Franklin Street, Chicago, was devoted to this work. Here were gathered about 175 men engaged in receiving, compiling, editing, and transmitting election news and bulletins throughout the night, and from about 5 o'clock p.m until after midnight this was the centre of election news activity in the city. Three sets of bulletins were prepared: the continuous bulletins, which averaged one minute; the ten-minute bulletins for Chicago subscribers; and the 30-minute bulletins for the suburban area. Special readers transmitted the continuous bulletins to newspapers, clubs and various public gatherings. These readers, by a combination of instruments, were able to talk into ten transmitters at the same time, and in some cases four or five lines were grouped on to each transmitter. The ten-minute bulletins were transmitted by readers directly to each of the company's 23 principal exchanges and ten or more neighbouring exchanges about Chicago. To receive the news the subscribers of these exchanges had simply to ask the operator for telephone bulletins. The operator would announce the number of the current bulletin, and order the subscribers' lines to be connected with a group being formed at that moment; the bulletin reader meanwhile was announcing the bulletin to a group previously made up. At the end of each bulletin the reader switched from one group to the other and proceeded with his work. At the close of each bulletin the subscribers' lines in the group were disconnected, and they were able to call again for the next bulletin. The total number of calls for election news received in this way during the evening was 53,298. The greatest number came from exchanges in the residence districts, where thousands



of subscribers heard the latest election news without leaving their own homes.

Many commendations of the Press and subscribers have attested to this really wonderful service throughout the country on election night. The success of the bulletin transmission has demonstrated once more that the telephone is the greatest and quickest news distributor.

(We are indebted for the foregoing particulars to Mr. Hibberd, the Vice-President and General Manager of the Chicago Telephone Company.)

TELEPHONE WOMEN.

XXXI.—EMILY HARDY.

MISS HARDY was born in Preston, Lancashire. When the telephone industry, was first opening out a new profession for the gentler sex, she entered the service of the Northern District Telephone Company, being the sixth lady to join. Mr. C. B. Clay was at that time manager, and Mr. R. A Dalzell, local manager for the Northern District Telephone Company, and the head office was at Sunderland.

Miss Hardy lost no time in getting to business, for, finishing school one evening, she attended at Sunderland Exchange the next

morning. Two days later saw her operating at a local position, whilst within a month her ability found scope in the manipulation of the trunk section. Boys had previously worked the boards, but their services were only retained in the switchroom until the girls had become intimate with the working of the switchboards. Traffic was evidently not then so brisk in Sunderland as it is nowadays, for the boys used to recline in chairs placed some 6 feet away from the boards, and when a subscriber called or gave the clearing signal, a boy would go to the board, and after making or breaking the necessary connections, would retire to his chair to wait for the next call. Team work was of course unknown in those days, the male clerk-in-charge urging his staff with such expressions as, "Come along there, that man's been ringing a month!"

The boys were somewhat jealous because their feminine co-workers were allowed to sit up at the boards continuously; but to occupy their spare time the former were given letters to address, seal and stamp, and at a later date they were transferred to the technical staff.

Whilst at Sunderland experiments were made with the various kinds of headgears, and Miss Hardy was often the person experimented on. Compared with the headgears of the present day some of them were fearfully and wonderfully made, varying from an apparatus with several headbands and a thick rope of receiver cord to an arrangement with receiver tubes ending in nasty little plugs, which fitted into the ears after the fashion of some stethoscopes.

With the absorption of the Northern District Telephone Company by the National, the Sunderland offices were moved to Newcastle, and Miss Hardy was also transferred to that place. After six years at Newcastle, she was tranferred to Liverpool (Central), and in a short time was selected for the position of Clerk-in-Charge at Burnley.

At the end of 1901 Miss Hardy returned to Liverpool, and a few months later was appointed Clerk-in-Charge of the sub-exchange at Sefton Park. With the opening of the Royal

EMILY HARDY.

Exchange, she was transferred thence as Senior Supervisor, and twelve months later was appointed Clerk-in-Charge, a position which she has since occupied with much credit. In December next she will complete 21 years of telephone work. Varied and interesting those years have been, more so than usually falls to the lot of a clerk-in-charge, and it is a matter for some regret that Miss Hardy has not kept a diary.

Beyond her work she has no hobby; but looking back, as she does with infinite pleasure, on her years of telephone work, she never regrets her entry into the service in the year 1887.

XXXII.—HENRIETTA DAGGER.

MISS DAGGER joined the service on July 21, 1887, and thus completes 21 years' service this year. At the time of her entry into the service there were about 1,000 subscribers connected to the Liverpool Central Exchange, with a staff of 29 operators, whilst at present there are over 5,000 subscribers and a total staff of 185.

When the trunk lines were transferred to the Post Office in 1896, Miss Dagger declined an offer of service with the department, preferring to remain loyal to the Company.

HENRIETTA DAGGER.

During her long and faithful service, she has had a varied telephonic experience, having operated for nine years, supervised seven years, and for five years she has held a Clerk-in-Charge's position at the Central Exchange. She has served under two provincial superintendents, three district managers, five electricians, and six clerks-in-charge.

COUNT ARCO ON OCEAN WIRELESS TELEPHONY.

THE following is an abridged translation of an article by Count Arco, the well-known German electrician, in the *Allgemeine Zeitung*:—

"Still more wonderful than the fact that news can be transmitted hundreds and even thousands of miles by wireless telegraphy to-day is to the lay mind the knowledge that it is now possible for the tones of the human voice to be carried afar by means of wireless telephony. To the wonders of (wireless) telegraphy people have been accustomed in the course of the last ten years, but the wonder of (wireless) telephony is still fresh, and, therefore, produces a greater effect. Some weeks ago the news appeared in the daily Press that an American, named de Forest, had made an arrangement with the French Government whereby he bound himself to establish within two years a transatlantic wireless telephone between the Eiffel Tower in Paris and the Record Sky-scraper (or 'Cloud-scratcher,' as our contemporary puts it), of the Equitable Company in New York which is still building.

"I will describe shortly what a wireless telephone installation appears like, and discuss whether any genuine prospects of this talk across the ocean actually exist, and especially what economic value such an installation can have.

"Over small distances wireless telephony has been repeatedly carried out. The first time it was successful in Germany was in

December, 1906, when speech was carried 40 kilometres by the Telefunken-Gesellschaft between representatives of the Imperial Post Office in Berlin. This experiment is a landmark in the history of the development of the art.

"In recent years the Telefunken people, with relatively small means, have been able to carry words and whole sentences nearly 100 kilometres. Further experiments in increased distances have not been undertaken. At a distance of 300 kilometres, certainly by the application of notably larger technical resources, the Amalgamated Radio Telegraphic Company in Berlin made a successful experiment whereby speech was transmitted between Berlin and Lingby, near Copenhagen. With these results the actual facts are exhausted.

"An American inventor, Professor Fessenden, claims in different technical newspapers to have telephoned over greater distances by wireless or 'radio' methods, but objective proof of his claim is wanting. Between existing records and trans-atlantic telephony is a monstrous step, 300 kilometres to 6,000 kilometres!

"When the lay mind conjures up a station for wireless telephony it is in all cases a picture of the usual telephone apparatus." Count Arco here describes the ordinary process of telephoning and goes on to say: "The layman must clear all this out of his mind if he will picture a wireless telephone station for Paris—New York, or even a small radio-telephone installation. A radio-telephone installation looks exactly like a radio-telegraph station. Its principal and most indispensable part is the aerial conductor or antenna, which in some cases attains gigantic dimensions. Upon a space about a tenth as large as the Tempelhofer-Feld stands an erection of the size of the Eiffel Tower, thus appears the antenna of a large radio-station. Germany possesses two wireless stations with gigantic antennæ, one of which belongs to the Imperial Post Office in Norddeich, and the other is at Nauen, near Berlin, and is the experimental station of the Telefunken-Gesellschaft. In Nauen an iron tower has been erected 100 feet high, and from its top run on all sides, like the ribs of an umbrella, 200 wires each about 200 millimetres long in a wide circle down to the earth. These aerial lines cover a circular surface of 1 kilometer diameter. (?)

"What is the technical purpose of these antennæ? At the foot of the tower stands a small building in which a steam engine of not more than 100 horse-power drives a current-generating dynamo. The electrical current is changed by the necessary apparatus into a form of energy which is described as electrical oscillations. These are radiated through the aerial wire and dispersed either equally in all directions, or most strongly in a particular direction. The aerial wire is the radiating apparatus of the station. In the form of electrical waves the radiation travels into space with the rapidity of light. At the receiving station there is another or similar aerial collector. This in a certain manner sucks in the waves coming from afar out of space and takes up part of their energy. From the receiving aerial this energy is then transmitted to the proper receiving apparatus, and made perceptible in some manner or other; for example, by means of a slight rattling in a telephone receiver.

"In the case of the radio-telegraph messages are transmitted in the form of Morse signals. The dots and dashes of the Morse alphabet are transmitted as longer or shorter electrical radiations and heard in the telephone at the receiving station as longer or shorter rattlings.

"For telephony all this apparatus is retained: the power plant, the gigantic aerial apparatus, etc. The only difference is that the variation in the radiation is not made by the Morse key, but the radiation remains uninterrupted, so that in consequence of its being influenced by the human voice by means of a microphone very fine variations are produced, which are reproduced at the receiving end exactly as at the transmitting end, and are perceptible as very slight sounds of speech in the telephone receiver. The radio-telephone station is thus a radio-telegraph station, only instead of the radiation being influenced by the Morse key worked by hand it is influenced by the human voice through a microphone.

"But with this the disparity between wireless telephony and wire telephony is not exhausted. For a distance of several thousand kilometres about 100 horse-power for generating current must, as I have already said, be applied, or about 1·5 horse-power per 100 kilometres, and of this electrical energy one-tenth to two-tenths is changed into electrical oscillations and taken to the antenna as radiating apparatus. That makes for small stations 0·15 to 0·3, and for large stations 10 to 20 horse-power in the form of electrical oscillations in the antennæ. These must be sufficiently influenced in speaking to correspond with the different vowels and consonants of speech. The influencing ensues from the switching in of the microphone which is spoken into. The reader will readily perceive that this is a problem not easily to be settled. A microphone so simple and small that we could easily hold it with two fingers, with a tiny membrane therein against which we speak, must be sufficiently effective to influence an electrical energy of 10 to 20 horse-power. This, however, cannot be done. Even in small stations the microphone begins to smoke in a few minutes, although in these cases an extra large and strong microphone is used. In the case of greater distances and greater electrical force several microphones must be used at the same time, which must be all influenced at the same time by the voice. There is thus a whole battery of microphones, and not the most powerful voice of a hero-tenor of Grand Opera would suffice to put a dozen or more microphones in adequately powerful oscillation at the same time. We should require a megaphone or a regular roaring machine to assist us. Equally sad is the state of things at the receiving station. In spite of the mighty roaring of the sender at the receiving point only a very, very slight sound is heard. For unpractised ears this is not sufficient, and one is forced to apply a sound strengthener. But a good sound-strengthener does not at present exist. It must be so constructed that the different vowels and consonants are strengthened in equal measure. In actual practice, however, only the strenthening of certain vowels has been accomplished, whilst others and particularly the consonants are weakened. This gives rise to such disturbance of sound that nothing at all can be understood.

"Such then are the prospects at present of transatlantic wireless telephony between Paris and New York.

"But we will endeavour to be optimistic and will suppose that all these difficulties have been overcome in two years, even although no signs of this are at hand. How would then a telephone conversation take place? The person desiring to speak would have to present himself at the giant station and wait there as long as was necessary in order to speak. Apparently it would be useful to give notice about eight days beforehand, and fix an appointed hour. We will give our optimism the rein still further, and—according to the pattern of Bellamy and others—go a couple of thousand years ahead. Then we can imagine that we take our own telephone in our hand and get connection over the trunk wires with Paris, in order to be plugged on to the Eiffel Tower, and then by means of intermediate switching through the strengthened speaking apparatus at the transmitting end, and through the sound strengthener at the receiving end, talk to somebody sitting at his desk in his own room in San Francisco about what was on at the theatre the evening before.

"But we will not drive our optimism so far. We will rather limit ourselves to the real prospects of radio-telephony for the next two years, and here we come to our earlier conclusion that these prospects are very slight.

"Wireless telephony has as yet no field of operation and will receive none in the immediate future, according to my opinion, neither where telephony by wire is possible, nor where no competition exists from the ordinary telephone—namely, between passing ships or between ships and the shore. It will remain even in this field, for some time, an expensive technical toy."—W. H. G.

A GOOD WORD FOR THE TELEPHONE SERVICE.

A BRADFORD subscriber has written the Company to the following effect:—

"We wish to take this opportunity of mentioning to you, entirely unsolicited by any member of your staff, our appreciation of the excellent service we are now getting on our telephone. It is both prompt and courteous, and if it is in accordance with your rules we should like this appreciation to be conveyed to the operators and others who help to make this efficiency of service.

"We may add that if we had complaints to make we should not hesitate to make them, therefore we feel pleasure in acknowledging a good service."

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
TELEPHONE HOUSE, VICTORIA EMBANKMENT LONDON, E.C.

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VOL. III.] JANUARY, 1909. [No. 34.

TELEPHONE MANNERS.

RATHER more than a year ago in an article on the "Humourist and the Operators" we referred to the facile and somewhat pointless satire frequently levelled at the staff in the exchanges. During the past month the Postmaster-General seems to have played most indulgently into the humourists' hands by issuing, not only to his staff of telephonists but also, it would appear, to the Central News authorities, what we cannot but consider a somewhat supererogatory and laboured instruction enjoining courtesy.

This instruction, which bluntly counsels the trunk operators to avoid abrupt and uncouth expressions, and lays down certain "standard expressions" to be used by them, besides casting a gratuitous slur on the operating staff, gives occasion to a good deal of levity in the Press, although we are glad to see that not a few newspapers suggest that the manners of some subscribers are not above criticism. When incivility is thus imputed by implication to a class which we believe on the whole to be obliging under circumstances of great hurry and pressure, it is small wonder that the new era which the Postmaster-General's order is supposed to usher in is received with sarcastic approval by the lay critic.

The issue to postal employees of admonitions to politeness is not altogether a new thing. Not many years ago similar instructions were addressed to the attendants behind Post Office counters. In the case of telephone operators, however, we do not think the suggestion of abruptness and uncouthness is warranted. At any rate a remedy will hardly be found in the somewhat plentiful peppering of "pleases" which the Post Office instructions contain for after all it is the tone of voice which really conveys politeness and the sense of being willing to oblige. As regards the use of the word "please"—judiciously, for brevity is a weighty consideration in telephone correspondence—readers of the JOURNAL will remember that the order issued by an American company for its discontinuance evoked a strong feeling in this country for its retention.

The Company's operators have always been inculcated with the maxim that under any provocation whatsoever politeness to subscribers must always be maintained, and in the course of their very exacting duties there is little doubt that they have maintained and do maintain generally an attitude of patient politeness. This brings us to an aspect of the question to which we refer with some reluctance. Probably the large majority of subscribers have little conception of the language, not only abusive but absolutely foul, addressed to girls by a quite considerable minority of telephone users whose irascibility and impatience habitually takes a foul-mouthed turn. It is a cowardly as well as a ruffianly practice, because to a large extent the identity of the user is concealed behind the telephone, enabling him to indulge in expressions which otherwise he would not dare to use before a woman. Of course the Company deals in a drastic manner with such subscribers, but the natural reluctance of most operators to repeat foul epithets to their clerks-in-charge explains to some extent why the worst offenders are not always brought to book. We are, therefore, as we have already said, very glad to see that several newspapers in commenting on the Postmaster-General's order admit that operators have a great deal to put up with.

TRANSATLANTIC WIRELESS TELEGRAPHY.

THE prophecies of men of science would appear to vary between extreme caution and the most extravagant optimism. On the one hand the man who has wrung some secret from nature by anxious years of incessant study and experiment hesitates to magnify the possibilites of his invention almost into the miraculous, and to vaunt that it will in a few years revolutionise art and life; that man, on the other hand, who has seen an invention increase its scope ten or an hundredfold in three or four years is often so carried away by a somewhat natural enthusiasm as to see almost no limit to its development—a thousandfold or infinitude is not too much for his sanguine expectations. As an example of our meaning, BRUNEL told a horrified Parliamentary Committee in the thirties that he shortly hoped to travel by steam at 100 miles an hour. The rapid progress made from fifteen to fifty miles an hour would, at first sight, seemed to have justified the prophesy, but the most enthusiastic admirer of flying express trains must admit that the consummation has not yet been nor is likely to be reached. Ninety odd miles an hour over favourable half-miles is the best that can be claimed in ordinary railway practice. No doubt, 150 years ago the more optimistic aeronauts thought they could foresee the successful navigation of the air, but even now it cannot fairly be said that that end is in view.

The wonder of wireless telegraphy has been succeeded even in a very early stage of its development by that of wireless telephony, and the success of the latter over what may be described comparatively as long distances has given rise to most unbounded expectations and the most ambitious projects. It is said that Dr. LEE DE FOREST has made arrangements with the French Government for the use of the Eiffel Tower for the purpose

of establishing wireless telephone communication between Paris and New York. The 700-feet high tower of the Metropolitan Life Assurance building is to be used at the American end, and DR. DE FOREST expects to make communication possible within the short period of two years. Count ARCO, whose opinion as chief engineer of the Gesellschaft für Drahtlose Telegraphie of Berlin is of weight, criticises the project in an article which we reproduce in an abridged translation. As he points out, the jump from the distance of 300 kilometres (which represents the maximum of success in Europe) to 6,000 kilometres is certainly enormous; and DR. DE FOREST admits that the present range of his apparatus is only 1,000 miles. Much, however, may happen in two years, and we would be glad to see this triumph of telephony accomplished. Count ARCO, however, thinks the prospect is extremely slight, and goes on to say that the wireless telephone will remain for some time to come an expensive technical toy. This, perhaps, is an unduly conservative view. As we have already said, we consider that in communication between ship and ship and ship and shore there is a great field for wireless telephony. The transition of great inventions from the "scientific toy" stage to great commercial utility is often so sudden and so complete that we, at least, should consider it rash to prophesy doubt and disbelief.

FRANKNESS AND RETICENCE.

THE glimpses of the inner working of an exchange, without doubt the part of the Company's work which appeals most strongly to the telephone user, which are occasionally given in our columns, should prove of unusual interest to those subscribers making extensive use of the telephone into whose hands the JOURNAL may fall. These articles explain with great fulness the difficulties to be contended with, the means of overcoming them, the unceasing experiments made with the object of improving the service, and frankly set out in the case of errors and ineffective calls the proportion of blame between subscriber and operator.

In commercial dealings frankness and diplomatic caution have each their place, and the exigencies of business at times demand both; but there is little doubt that frankness commands confidence, and an excess of diplomacy the reverse. In the case of a public service we think it is good policy to adopt a broad view and to throw light on the intricate problems of traffic which have to be solved, and to show the public the manifold efforts perpetually applied to that end and the magnitude of the task. This surely is a better course than an assumption of superhuman perfection on the part of the staff, and of infallibility in the apparatus. If it is made clear that the latest research is applied to the latter and the most thorough training and supervision to the former, the reasonable man will be convinced that he is being reasonably served. After all, the reasonable man is in the majority; it is not his *metier* like that of a barrister to seize on some small admission and twist it into a general confession of failure. A frank exposition of a weak joint in the armour, and an explanation of the pains taken to remedy it gains his confidence, whilst a too clever reticence often suggests that there is a lot to conceal, and a claim to infallibility only moves the sceptical to cry, "Methinks the gentleman doth protest too much!"

Mr. S. J. GODDARD, the General Superintendent, and Mr. W. W. COOK, the Assistant Engineer-in-Chief of the Company, returned from America on Dec. 3 on board the *Lusitania*, after being delayed two days in all by fog. Besides a stay in New York, they visited Boston, Montreal, Toronto, Buffalo and Chicago.

Mr. THEODORE N. VAIL, President of the American Telephone & Telegraph Company, and Mr. H. B. THAYER, the President, and Mr. WELLS, the Vice-President, of the Western Electric Company, recently visited Telephone House.

HIC ET UBIQUE.

A CORRESPONDENT sends us the following succinct report made by a subordinate telephone inspector to his chief. It concerned a faulty house connection:—

"Found wire with no outside outside. Put inside wire outside and outside inside. Need more outside for inside."

TRULY with all our specialised staff we doubt if every advantage of the house telephone is pressed home to prospective subscribers. For instance, a Scottish journalist says that some nights ago, a party of men returning from a late meeting of some sort established themselves on the pavement opposite his bedroom window at one in the morning, and ardently and loudly discussed theological and other topics till twenty minutes past two. It became intolerable. He rang up the district police office, and politely requested that a constable might be sent to move these inconsiderate debaters on. In ten minutes he was on the scene just in time to nip in the bud a promising new controversy on justification by faith.

We had never thought of the telephone as an aid in settling theological controversy.

A TELEPHONE line, neither overhead nor underground, might form the subject of a conundrum, yet the line to Regina Margherita Meteorological Observatory on Mount Rosa (the highest telephone line in Europe, being at an altitude of 14,598 feet) answers to this description. "It was found impossible to run it on poles, owing to high winds and bad storms which prevail at these altitudes. It was also thought to be impracticable to lay an insulated cable, as it would gradually sink into the ice and would make repairs impossible. The final solution of the problem was to lay a bare wire across the glaciers, and depend upon the insulating qualities of the snow and ice."

FOREIGN INTELLIGENCE.

Sweden.—The official statistics of the Swedish Telegraph Department show that the number of state telephone exchanges have increased from 1,497 in 1906 to 1,625 in 1907, and the number of stations from 90,811 to 102,094. The principal systems were Stockholm, 17,817; Gothenburg, 10,547; Malmö, 5,436; Gefle, 3,245; Norrköping, 3,136; Örebro, 2,454; Sundsvall, 2402; Upsal, 2,156; and Helsingborg, 2,191. The length of lines has increased from 183,261 to 209,370 kilometres.

Denmark.—*From the official statistics of the Danish telephone* system the number of telephone subscribers (not stations) in the principal towns were as follows:—(1908) Copenhagen, 28,685; Holback, 1,268; Odense, 1,751; Aalborg, 2.586; Aarhus, 2,985; Randers, 1,371; Horsens, 1,108; and Kolding, 1,257 The telephone has been extended to the Faroe Islands lying in the Atlantic between Scotland and Iceland. They have now 88 subscribers (Thorshavn, the principal town, having 34), and have thus the start of the Orkney and Shetland Islands, where the telephone exchange has not yet penetrated.

New Zealand.—The length of telephone lines advanced from 1,525 kilometres in March, 1907, to 1,672 in 1908, and the mileage of wire (in kilometres) from 24,272 to 29,972. There are now 3,781 stations in Wellington, 3,184 in Auckland, 2,978 in Christchurch, and 2,713 in Dunedin. The total number of stations increased during the year from 17,403 to 23,881.

A POPULAR VIEW OF THE ELECTRON THEORY.

BY J. R. MILNES, *Engineer-in-Chief's Department.*

(*Continued from page* 191.)

IV.

The Electric Current and Magnetism.—In the primary battery described, we have seen that the tendency of the zinc, or electro-positive element, to part with electrons to the copper, or electro-negative element, enables chemical action to take place at the zinc, and supplies the free electrons which proceed along the conductor outside the cell to the copper pole, and there unite with the positively charged hydrogen atoms; also that the current flow inside the cell is due to the constant attraction of the zinc plate (which is continually and automatically being depleted of electrons) for the negative ions of the dissociated hydrochloric acid in the electrolyte; that this current in the electrolyte is therefore caused by a flow of negative ions towards the zinc plate, the action being rendered easier by the state of ionsation of the hydrochloric acid.

We now have to consider what takes place in the mass of the outside metallic conductor.

As has been mentioned before, there is a constant interchange of electrons taking place in the mass of any good metallic conductor, the conductivity depending to a certain extent on the ease with which these transfers take place. Now the current flow in a conductor will be found to be not dissimilar to the current flow in an electrolyte. In a mass of copper we have a large number of electrons roaming free at any moment, and in an electrolyte we have a large number of negative and positive ions roaming free.

The chief difference between the two cases consists in the fact that whereas the electrons themselves are free in the metal, in the electrolyte they are combined with the atoms of chlorine and form the negative ions.

It will at once be recognised that as the ease of movement of the carriers (electrons or ions) determines the conductivity, and both are moved by the same amount of energy (that of the electron), those electrons *not* associated with atoms will be capable of a much less impeded movement, the energy being the same but the mass or bulk being enormously greater in the case of the ion. A metal will therefore always be a better conductor than an electrolyte provided it is one in which the movement of electrons is free.

Let us now consider the moment when the first electron leaves the zinc to travel, as we might suppose, along the copper wire towards the copper pole of the battery. What actually happens is that an almost simultaneous transfer of electrons takes place along the whole line of the copper atoms assisted of course by the free electrons. Our electron liberated at the zinc enters into combination with a copper atom whose electron is at the moment roaming, the roaming electron has now no copper atom to return to and invades the nearest atom where an electron is required, and this enormously rapid transfer takes place all along the wire until a free electron is liberated at the positive pole which hastens to unite with the hydrogen ion waiting to be released as a gas. This is a very similar proceeding to that shown in the diagram of the Grotthuss theory of electrolysis.

It must be recognised, however, that both in the case of electrolysis and also in metallic conduction the diagram must not be confused with the actual transfers taking place, and this cannot be too greatly emphasised. As has been pointed out the dissociation theory has so far modified the Grotthuss theory as to make it probable that the hydrogen and chlorine ions permeate the liquid in anything but the martialled order in which they have to be shown in the diagram, and in metallic conduction the actual transfer of electrons is probably exceedingly irregular, depending on an enormous number of trivial temperature differences and irregularities in the homogeneity of the metal. Thus great care must be taken not to confuse the principle of the proceeding under ideal conditions with what actually happens in practice, it being still recognised that owing to the vast number of electrons taking part in a current flow the *average* of their movements may correspond very closely with the ideal principle.

The speed of travel of the electrons is the measure of what we call electro-motive force.

The number of electrons passing any section of the conductor in unit time measures the current.

It will be seen that both the above rules are dependent on the structure of the body through which or by whose agency the electrons flow. This has been called resistance. It may be stated broadly that the resistance of a conductor is due to the amount of electron energy which it converts into heat. This loss of electron energy by heat or radiation is generally due to collisions which take place between neutral atoms and electrons; the collisions are always attended by radiation and consequent loss of energy.

Magnetism.—Perhaps the simplest way of arriving at a conception of magnetism, which after all is merely an effect of electricity is to give two definitions of electric current.

(*a*) One ampere is equivalent to a flow of 8·79 trillion electrons per second.

(*b*) An ampere is equivalent to that current which, when passing through two circular conductors 1 meter in circumference in the same direction, causes them to attract one another with a force of 2 dynes when 1 centimetre apart, or to repel one another with the same force when passing in opposite directions.

It will be seen that the ampere is equivalent to a certain magnetic force, and also to the passage of 8·79 trillion electrons per second. From this we may proceed to determine the forces between moving electrons, and shall be able to note clearly the relationship between the electro-static and electro-magnetic effects.

The electro-static force may be considered as invariable, its unit being the energy of the electron.

The electro-magnetic force depends on the speed and direction of the electrons.

It will at once be evident that our definition of magnetism, closely approximating to that of Ampere's original theory, consists simply in stating that it is due to the steady motion of electrons in small orbits and, as Fournier d'Albe remarks,

"In broad outlines, the atoms of all bodies are surrounded by several electrons describing orbits round them, like the planets round the sun. When these orbits are in nearly the same plane, as in the solar system, the bodies are paramagnetic like aluminium, oxygen, etc. . . . when the orbits are large enough to influence each other across the average distance separating the atoms, the bodies are 'ferro-magnetic,' as in iron. When, on the other hand, the orbits of the electrons revolving round the same atom are in various planes the bodies are diamagnetic."

Thus we are able to dispense with all those terms which have given rise to so much confusion.

In view of the electron theory, "magnetic fluid," "magnetic pole," and "free magnetism" become meaningless phrases, and magnetism as a distinct entity disappears, being resolved into the steady motion of electrons.

Errata.—Page 190.—Description of Fig. 1. "Chlorine atom at negative" *should read* "chlorine atom at anode." "To form zinc chlorine" *should read* "to form zinc chloride."

(*To be continued.*)

RE-ISSUE OF THE REPORT OF THE PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF TELEGRAPH AND TELEPHONE ENGINEERS AT BUDA PESTH.

WE are informed that the first edition of this work is exhausted, and that it is intended to prepare a new edition if a sufficient number, say, 300 copies, are subscribed for. Subscriptions should be addressed to M. André de Kolossváry, Direction Générale des Postes et Télégraphes, Buda Pesth, Albrecht-ut 3. The price will be about 8s. to 11s., according to the number of subscriptions received. The book contains articles in French and German, including papers on telephone work by Messrs. C. E. Krarup, Karl Strecker, Barth von Wehrenalp, H. K. Steidle, Béla Gáti, J. G. Hill, F. Gutzmann, J. Hollór, M. Barille, and Axel Hultmann.

COMMON BATTERY PRIVATE BRANCH EXCHANGE, ARMY & NAVY STORES, LONDON

BY P. J. RIDD, *Construction Electrician.*

THE common battery switchboard opened in September last at the Army and Navy Stores is the largest (in the number of working positions) fitted in the Metropolitan area, and a few notes in connection with this installation will possibly be of interest to readers of the JOURNAL.

The work carried out comprised the replacement of the existing four-position hand-restoring indicator switchboard by a common

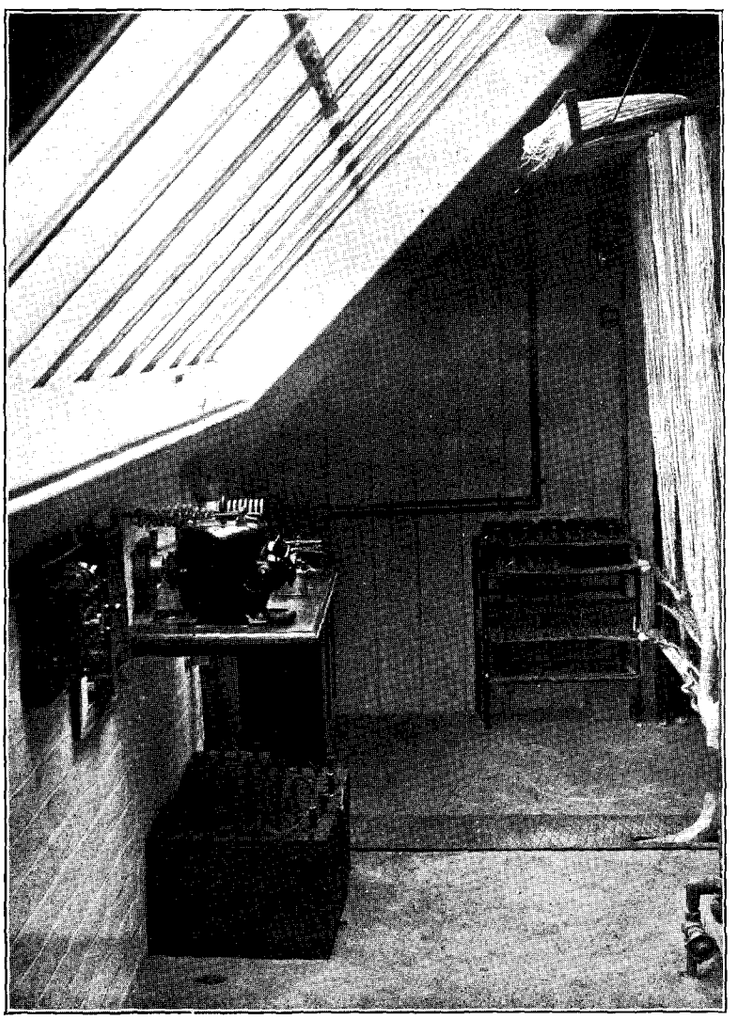


FIG. 1.—MAIN FRAME (REAR).

battery switchboard No. 2,501, Western Electric type, consisting of seven one-position sections, the connection of 65 additional extension circuits, the re-wiring of the great majority of the extension circuits throughout, and the replacement of the whole of the magneto by common battery instruments. A change was also made in the operating staff, the boy operators of the old installation being replaced by operators on the Company's staff.

There are at present working 24 exchange lines and 278 extension stations, 57 of the latter being automatic pay stations.

The new switchroom is located at some distance from the old switchroom, and provides ample accommodation for any possible future extension. The whole of the leads are taken from the main frame in a 400-pair lead-covered cable. This cable is divided and the leads for the extensions are taken through distributing cables to the different blocks of buildings, thence through small cables or lead twins down the outside of the buildings to points as convenient as possible to the positions of the instruments. Where it was possible, with economy, to utilise the existing internal wiring, this was done; but owing to the alterations in the positions of instruments and distributing points, it was necessary, in a large proportion of cases, to re-wire this part of the circuit also.

An illustration is given of the main frame. This frame was made at the Metropolitan workshops, and is designed to take the full capacity of the switchboard, viz., 80 exchange lines and 400 extensions.

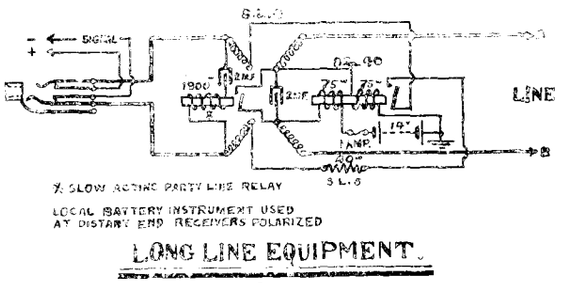


FIG. 2.

For the local extension circuits and for the switchboard cables strips of 280 tabs S.L. 14 (as used on the horizontal side of the common battery main frames) are mounted, and for the exchange lines and external extensions L.A. bars are fitted as shown.

Provision has also been made on the main frame for the fitting of twenty long line equipments, and as this installation is the first on which such equipments have been fitted, I have included the Head Office diagram for these circuits. As the name implies, the equipments are fitted on lines exceeding a certain limit of resistance, this resistance being that through which the supervisory signals will operate satisfactorily with a short extension loop connected on the fellow plug of the cord circuit. The signals are specified to work with 25 milliamperes, and the resistance limit for direct working on

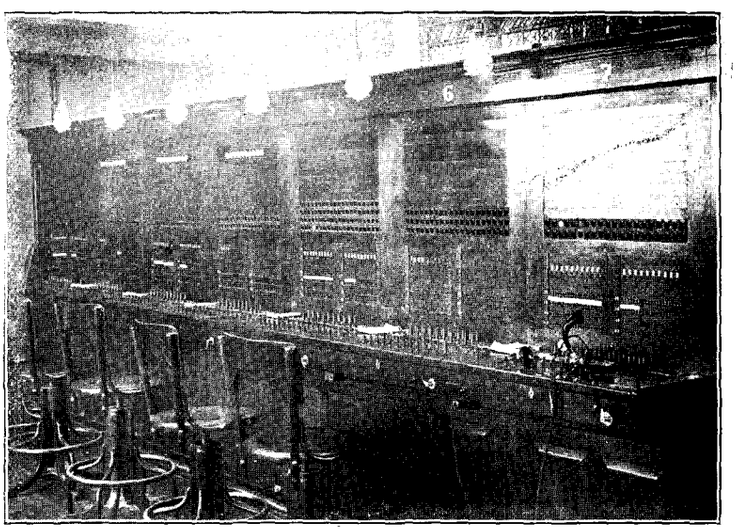


FIG. 3.—SWITCHBOARD (FACE).

extensions with 12 volts at the private branch exchange is about 30 ohms.

Photographs of the front and rear of the switchboard are shown. The illustration of the rear of the board shows the cables turning in the last two sections, from the multiple to the distribution tabs. The boards are wired as usual by the Western Electric Company for 200 calling signals, but the maximum number working on any one position in this installation is 80.

The power circuit in connection with this installation is also of interest, the usual power leads being replaced by accumulators which are charged over the exchange lines when these are disengaged. The cells used are E.P.S. Company, "Q.H. 7" type, and are fitted in a small cupboard, seen in the photograph.

The "T 11" accumulators in foreground were simply provided during the change-over for emergency purposes.

The circuit, which will be fitted generally in London where this method is approved, is appended; but at the Army and Navy Stores it was considered necessary to replace the 40-ohm spools by

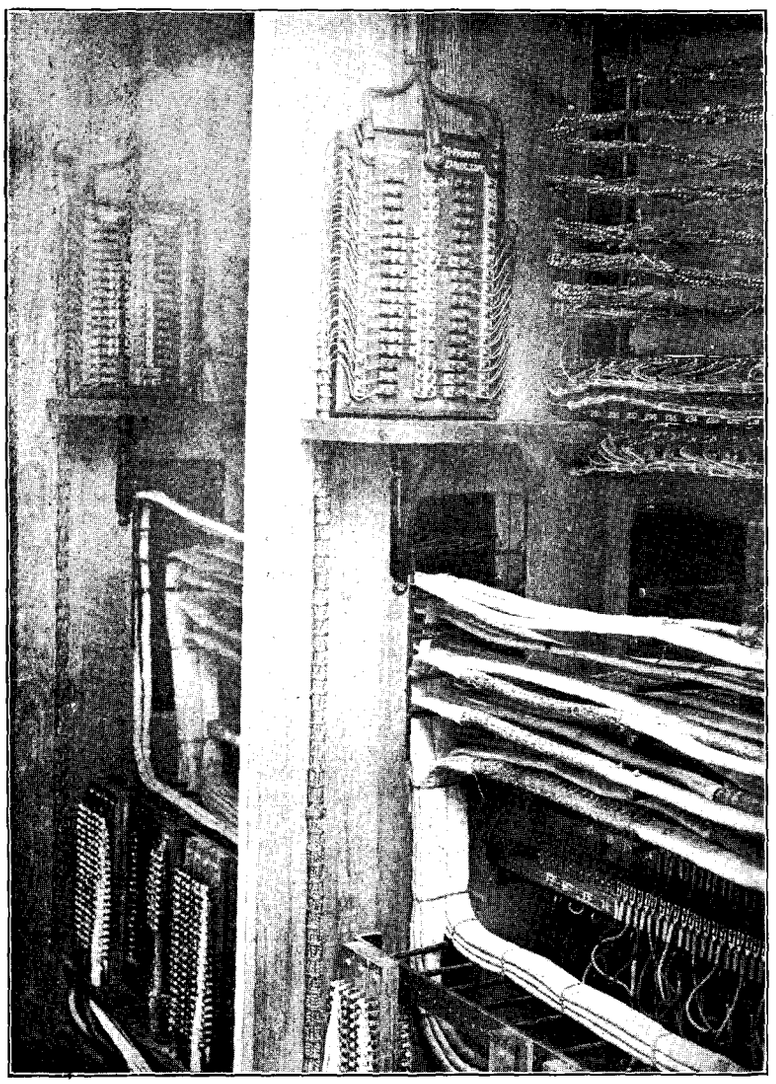
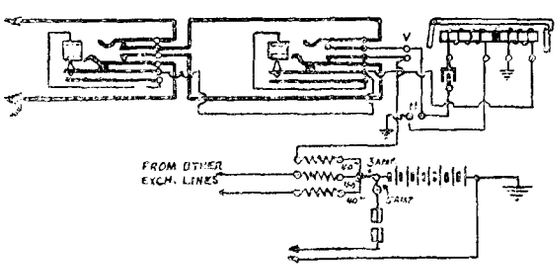


FIG. 4.—SWITCHBOARD (REAR).

1-ampere fuses in order to obtain a greater imput into the accumulators.

The weekly discharge is approximately 85 ampere-hours and the charge given over the exchange lines 95 ampere-hours.



ACCUMULATOR CHARGING OVER EX. LINE.

FIG. 5.

An article on this installation would certainly be incomplete without reference to the co-operation and excellent arrangements of Col. Strachey, who is evidently a telephone enthusiast. Printed instructions have been issued by Col. Strachey to the various departments, stating in detail the manner in which the telephone service is to be conducted, and telephone directories giving the public branch exchange numbers of the departments have been circulated among the members, the suggestion being made that orders should be given over the telephone. Visitors to the stores are also attracted to the automatic pay stations by means of flashlight signs.

CORRESPONDENCE.

CABLE ACROSS THE AVON.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I SEND you herewith a photograph which I think will be interesting as showing the method adopted in putting a cable across the Avon between Shirehampton and Ham Green on Nov. 30.

The cable consisted of a four-pair dry-core lead-covered armoured cable, and the distance from bank to bank was 180 yards. The total length of cable was 220 yards. The end was made fast on the Gloucester side and the boat was drawn across by a rope to the Somerset side in something under five minutes. The tide was of course high at the time, and as it receded the men dug a trench in

the mud for the cable to lie in. In the centre of the stream it was weighted with pole chairs.

I put a similar cable down in December, 1900. This is still working quite satisfactorily, but unfortunately there were only two pairs in it. We had therefore to lay the present one for the junctions to the Pill Exchange.

Bristol, Dec. 11. ALFRED PERKINS.

CENTRAL BATTERY INSTRUMENTS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR J. SPEIGHT seems hurt at my telling him that the bell coils do not form part of the speaking circuit of a central battery instrument, but whatever his opinion may be now, this is the point he raised as a query in his first letter, in which he writes that if the bell coils are included, the primary circuit would be 1,145ω. I do not agree that giving a definite name to the windings of the induction coil is a matter of opinion. The winding that induces a current in a neighbouring winding must be the primary, and the winding in which such a current is induced must be the secondary; I did not think this could be a subject of controversy. My correspondent also makes certain extracts from the original article, and sets them side by side to show how inconsistent or misleading my statements are, but if read in their proper place as part of the sentences to which they respectively belong, they are neither one nor the other, and do not require further qualification than they received. Prof. Huxley once said to an opponent "the important thing is not who is right and who is wrong, but what is right and what is wrong." As this correspondence seems in danger of degenerating into what Huxley so rightly condemned, I do not propose to pursue it further, and, so far as I am concerned, it is ended.

Dec. 12. J. H. STEWART.

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from p. 196.)

To deal firstly with the *1d.*, red-brown, imperforated, on small crown paper. A few sheets were issued on Jan. 20, 1841, but the general issue was not until Feb. 10. The earliest known copy is dated Jan. 21, 1841.

First state.—Plates 12 to 137 were used, and to a limited extent Plates 10 and 11, from which some sheets of the *1d.*, black, had already been printed.

The varieties of this stamp are two watermarks, the upper one inverted, mentioned in Wright and Creeke, page 26, and now in my possession, obtained from Mr. Stamford. Of which the *London Philatelist* says, January, 1899: "Errors are few and far between in British stamps, but Mr. Stamford has discovered a variety that will cause many eyes to ache in examining the *1d.*, red-brown, of 1841." In the specimen in question the small crown watermark *is repeated, the second one being inverted, etc.*

Plate 11.—Eight sheets were printed on Dickinson thread paper, unwatermarked and ungummed, May, 1841, as a suggestion to take the place of the watermark and to prevent fraud. I have the *Athenæum* for April 28, 1838, printed on Dickinson thread paper, and containing a review of evidence before the Select Committee.

I fear this reads rather like a catalogue, but my idea is that it will be an incentive to some of the readers to look for the varieties mentioned.

On the *1d.*, red, imperforated, 1840, there were at least four sets of letter punches used, which assist in ascertaining the date of issue, as the

First has well-shaped letters excepting the J.

Second has not such well-shaped letters, but the J is better shaped than in first set.

Third has letters larger and seldom found on stamps postmarked with cross.

Fourth has letters much larger, which were in use in 1852 and are never found with cross postmark.

Further assistance may be obtained from the postmarks, as in March, 1843, numbers from one to twelve were placed in the centre of the cross paté obliterating marks in use at the chief office.

In May, 1844, the cross paté was superseded by a number or numbers in bars.

The *2d.*, blue, with lines, imperforated, *1841.*—The plates to which stamps belong may be ascertained by examining the corner letters. For instance, on

Plate 3 the A has open top.
" 4 " A has filled top.
" 3 " J is round.
" 4 " J is square in shape.
" 3 " O is tall and narrow.
" 4 " O is more round.
" 3 " P has open top.
" 4 " P has filled top.

The imperforate condition of the stamps issued to the public led to many suggestions for facilitating the severance of them. The earliest suggestion I can find was from Aberdeen, Aug. 17, 1841, in a letter to Rowland Hill, signed J. B., but nothing came of it. In 1847 Henry Archer brought to notice a machine to overcome the difficulty, which was reported on by the Post Office on Oct. 14, 1847. On Oct. 13, 1847, Archer wrote to Hill enclosing a portion of a sheet rouletted by this machine. Wright and Creeke say some of these are still in existence; I have a pair taken from them. On Jan. 7, 1848, the Treasury authorised the circulation. The work was, however, not satisfactory, and with Mr. Edwin Hill's assistance the machine was made to perforate. I have a print of the official correspondence and memorials in the matter. In some cases of stamps, as their length is different to their width, to prevent alteration to guides on the perforating machine, the sheets were perforated horizontally or vertically, and sometimes the holes in the bed-plate into which the needles were to descend became filled with the pieces of paper previously punched out, and caused what we know as rough perfs. I have an interesting specimen in which none of the needles have perforated, and the stamp has been put through the machine again. In some countries, for instance, the unwatermarked Barbados ½*d*, green, and *1d.*, blue, are clean cut in one direction and rough in the other, but all the stamps in the same issue are not so, although they may have been perforated about the same time and by the same machine, because when the holes in the bed-plate filled, it was the operator's practice to pass a piece of greased paper through, which to an extent, by adhesion, cleared out some of the paper from the holes.

The Electric Telegraph Company's stamps were the first English stamps perforated by Perkins Bacon's machine, July 9, 1860, the needles of which were unequally spaced, and so they may be found gauging fourteen to sixteen and a half in 2 centimetres in various parts of the same stamp.

The first perforated stamp officially issued was the S.C. perf. sixteen, *1d.*, red, Die I, from Plate 152, issued Jan. 31, but probably not in the hands of the public before February, 1854.

When the original Die I began to show signs of wear, William Humphrey was employed to re-touch; the die was then known as Die II. S.C., perf. fourteen was adopted, as the sixteen was found to cut out too much paper and the sheets came to pieces easily.

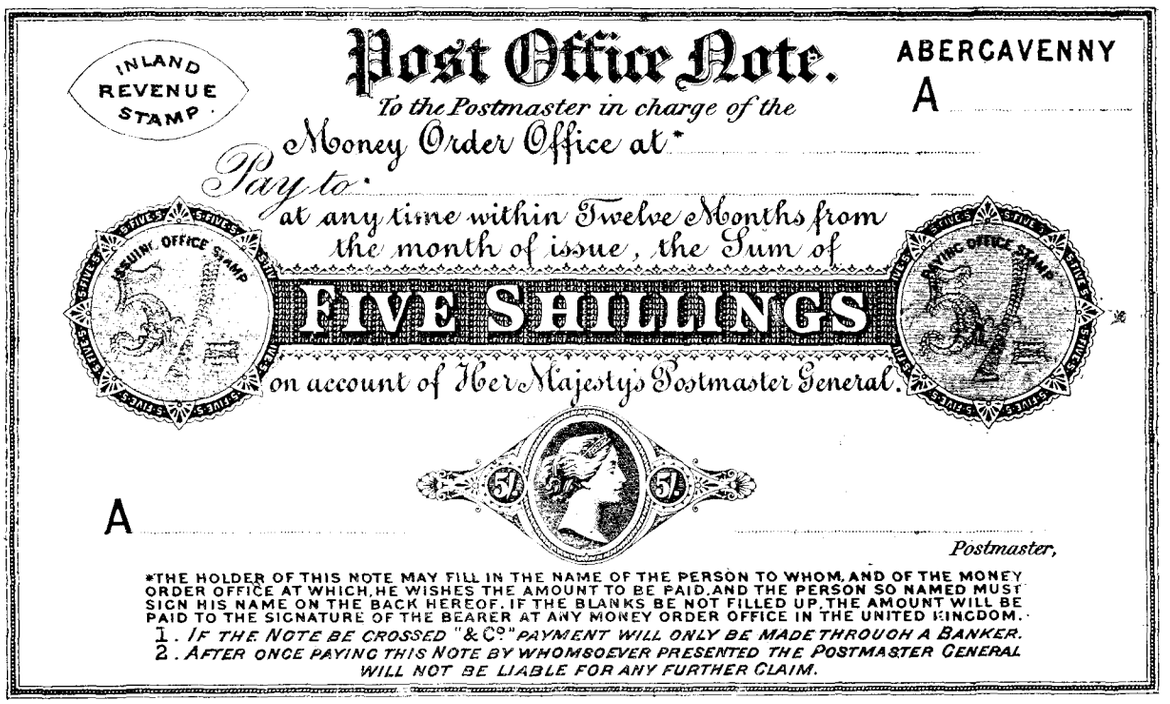
The watermark, fugitive ink, and the obliteration had not prevented fraud, as stamps only postmarked on half their surface were cut and used with other halves which had escaped obliteration, so the Government, by Rowland Hill, in July, 1858, issued a circular to the effect that stamps would in future bear plate numbers on each side, and that the letters in the bottom squares would be repeated at opposite angles, in the two top squares. This suggestion was tried by taking a roller impression of Die I of the *1d.*, the crosses removed, and letters substituted, and 123 engraved in sides of frame; this essay was printed in red on L.C. inverted.

The ideal collection should be of corner blocks, showing plate numbers on margin, thus—

The Post Office stamp indicating date had never been renowned for clearness, and perhaps the constant increase in the number of letters may have tended to make the dark darker still. At all events, means for improvement had been for some time in earnest consideration when circumstances drew public attention pointedly to the defect. At a trial presided over by Lord Campbell, towards the end of 1856, a question of some importance turned upon the precise date at which a letter was posted; and the stamp being too obscure to supply the necessary evidence, his lordship, though in a tone of general friendliness to the Post Office, animadverted rather sharply upon the failure.

More than two years elapsed before a satisfactory result was arrived at. Amongst the various machines tried there were several that would do the work, but such as produced legible marks were deficient in speed, and *vice versâ*; so

Rowland Hill Esqr
General Post Office
London


INLAND REVENUE STAMP
Post Office Note.
ABERCAVENNY
A
To the Postmaster in charge of the
Money Order Office at
Pay to
at any time within Twelve Months from the month of issue, the Sum of
ISSUING OFFICE STAMP
FIVE SHILLINGS
PAYING OFFICE STAMP
on account of Her Majesty's Postmaster General.
A
Postmaster,
*THE HOLDER OF THIS NOTE MAY FILL IN THE NAME OF THE PERSON TO WHOM, AND OF THE MONEY ORDER OFFICE AT WHICH, HE WISHES THE AMOUNT TO BE PAID, AND THE PERSON SO NAMED MUST SIGN HIS NAME ON THE BACK HEREOF. IF THE BLANKS BE NOT FILLED UP, THE AMOUNT WILL BE PAID TO THE SIGNATURE OF THE BEARER AT ANY MONEY ORDER OFFICE IN THE UNITED KINGDOM.
1. IF THE NOTE BE CROSSED "& Co." PAYMENT WILL ONLY BE MADE THROUGH A BANKER.
2. AFTER ONCE PAYING THIS NOTE BY WHOMSOEVER PRESENTED THE POSTMASTER GENERAL WILL NOT BE LIABLE FOR ANY FURTHER CLAIM.

that the human hand—imperfect as was its operation, still retained its superiority. In the year 1859, however, machines devised by my son, says Rowland Hill, were "at length constructed, which are found to perform the work of stamping and obliterating more quickly and perfectly than by hand. My son, however, laboured hard for further improvement, so successfully that at the present time, with much increased legibility in the impression, the speed of operation, as compared with the best hand work, is at least 50 per cent. higher. The value of his invention was, two or three years after my resignation, on Mr. Tilley's recommendation, handsomely recognised by a special grant of £1,500, of which, however, about £650 was in remuneration for actual outlay.

I show an envelope addressed and initialled by Pearson Hill to his father, Rowland Hill, marked No. 2, sent as an example of the machine stamps referred to.

Doubtless my readers are aware of the practice of sending money in the seals used on letters, which is mentioned in the life of Macaulay, and which to some extent led to the institution of postal orders. By the courtesy of Mr. Eustace Chetwynd I am able to show two essays submitted by the Bank of England to the Post Office. The vignette on one resembles the head of the Queen on the 24 c. Newfoundland, the other that on the Falkland Island stamp. To George Chetwynd, C.B., the nation owes not only the invention of the postal order remittance system, but also the establishment of the Savings Bank.

As I fear these notes are becoming somewhat technical I will leave this branch of the subject. But the history of the stamps of England would hardly be complete without some reference to the attempts which have been made to infringe upon the privileges of the Crown.

Two cases have been referred to—the London Penny Post established by William Dockwra, and the attempt by Povey ten years after to establish a halfpenny post. Since the issue of stamps, however, there have been other cases.

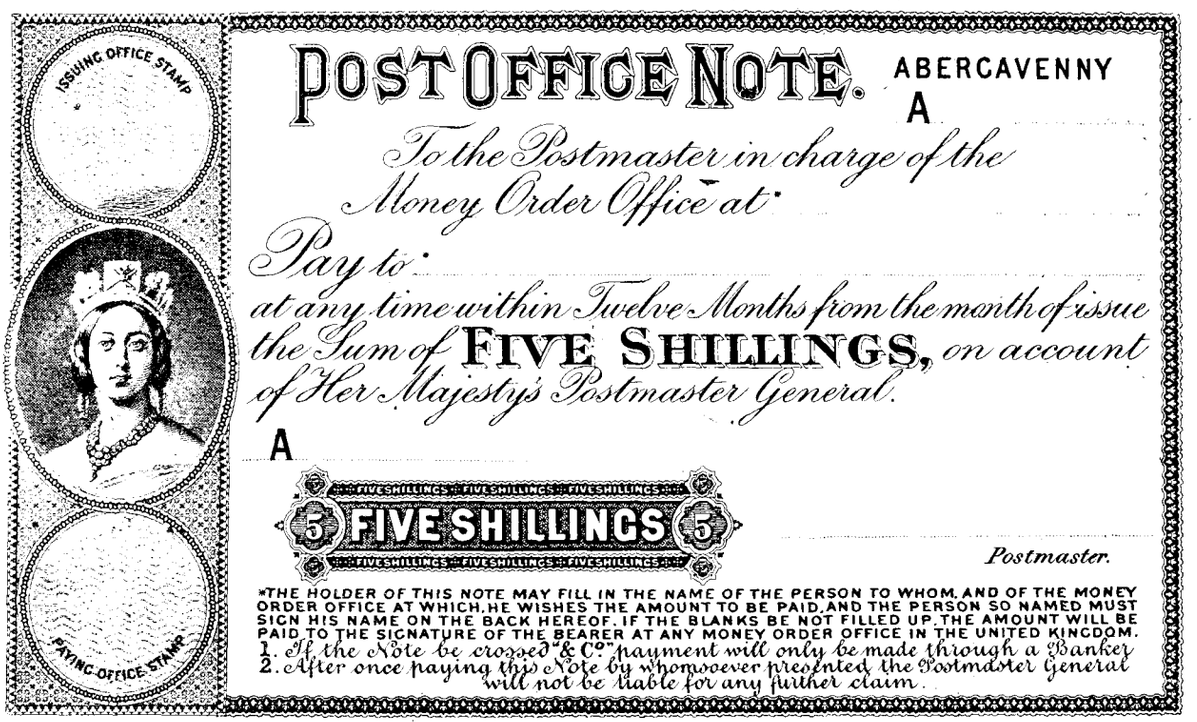
In 1865 a company was formed in Edinburgh, under the title of "The Edinburgh and Leith Circular Delivery Company," and adhesive stamps of the value of ½d. were prepared. I have a specimen used and cancelled with hand-stamp, "R. B. & Co."—Messrs. R. Bryden & Co., the proprietors.

The London Circular Delivery Company followed in 1866 with stamps, followed in 1867 by those inscribed "Metropolitan Delivery Company" and many others, some issuing ½d., ¾d. and 1d. stamps. I have an almost complete series of these, all of which were in use, and are chronicled in the *Philatelist*, 1868, etc.

In August, 1867, the London and Metropolitan Circular Delivery Companies were prosecuted, and all the other companies and their issues were stopped and confiscated. In 1890, notwithstanding the result of the prosecution of the London and Metropolitan Delivery Companies, "The Court Bureau" was started for the collection of postal matter at clubs, hotels, etc., on Sunday and late at night or early morning, for despatch by the early morning mails. Ordinary stamps had to be used for the postage; but for this service of expediting delivery a series of special stamps was prepared, and were in use up to March, 1891, when the company went into liquidation; so its existence was less than one year. The stamps are consequently rare.

The Express Messenger Service was first suggested to the Post Office by W. Bryson, the chief clerk at Inverness ten years before it was adopted by the department.

(To be continued.)


ISSUING OFFICE STAMP
PAYING OFFICE STAMP
POST OFFICE NOTE.
ABERCAVENNY
A
To the Postmaster in charge of the
Money Order Office at
Pay to
at any time within Twelve Months from the month of issue
the Sum of FIVE SHILLINGS, on account
of Her Majesty's Postmaster General.
A
FIVE SHILLINGS
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*THE HOLDER OF THIS NOTE MAY FILL IN THE NAME OF THE PERSON TO WHOM, AND OF THE MONEY ORDER OFFICE AT WHICH, HE WISHES THE AMOUNT TO BE PAID, AND THE PERSON SO NAMED MUST SIGN HIS NAME ON THE BACK HEREOF. IF THE BLANKS BE NOT FILLED UP, THE AMOUNT WILL BE PAID TO THE SIGNATURE OF THE BEARER AT ANY MONEY ORDER OFFICE IN THE UNITED KINGDOM.
1. If the Note be crossed "& Co." payment will only be made through a Banker
2. After once paying this Note by whomsoever presented the Postmaster General will not be liable for any further claim.

LOCAL TELEPHONE SOCIETIES.

Manchester.—A paper was read on Nov. 20 by Mr. J. P. Garner on "Telephone Instruments," which treated the subject thoroughly from the early types to the latest common battery. Not only were the types of instruments shown and described, but also the various methods of wiring them for their proper work. The principle of magneto working was described, as also were party lines and extensions. The paper was illustrated by lantern slides, and made more interesting by having the parts of a common battery instrument mounted on board and working.

Gloucester.—The first meeting of the society was held in the district office on Nov. 21, the District Manager presiding. Notwithstanding the inclement weather, it was well patronised by members of the staff from the home and outcentres. Out of 36 members, 33 attended, and there were four visitors. The District Manager (Mr. D. B. Fulton) gave a paper on "Transmission," explaining various points and calculations by means of the blackboard, illustrations being given by lantern slides.

The second meeting was held on Dec. 10, the District Manager being in the chair. A paper was read by Mr. A. E. Ryland, of the electrical staff, Stroud, on "Instrument Maintenance Work." The items dealt with were: Maintenance charges; relationship of operator to switchboard; supervising sub-exchanges; instructing exchange operators on reporting of faults; periodical visits to sub-exchanges and subscribers' instruments. Illustrations and explanations given by diagram. Mr. S. G. Hare also read a paper on "Stores Ledger Work" in connection with the No. 6 returns, describing the routine of a stores clerk's duties in respect of bookkeeping, and explaining the course of stores issue and credit slips from their leaving the stores to the completion of the return; also how to make up the No. 6 and 6a. Explanations were defined by diagram. As the outcome of the paper read several suggestions for curtailing the stores clerk's work and enabling the head officers better to control expenditure on material have been submitted, and are under consideration.

Cheltenham.—The third meeting of this society was held on Dec. 1 the president (Mr. D. B. Fulton) being in the chair. A paper on "Induction" was read by Mr. A. D. Pike. The whole available staff (100 per cent. of the membership) attended.

Gloucester (Cheltenham).—The fourth meeting was held on Dec. 15, and a paper, entitled "Contract Work," was read by Mr. C. E. Stevens (Contract Officer). The great value in a high-class residential town like Cheltenham, of a careful and systematic distribution of the Company's advertising literature, was emphasized. The vice-president (Mr. A. D. Pike), who was in the chair, thanked Mr. Stevens for his valuable paper. The whole of the members were present. Mr. Pike also gave a short paper on "Underground Work," illustrated by lantern slides, loaned by Mr. Jenkins (Bristol).

Isle of Man.—The syllabus for the session 1908-9 is as follows:—1908: Nov. 20, "Running Wires on Twist System, and getting Broken Wires up Temporarily," A. Smith; Dec. 4, "Prevention of Faults," Mr. Gillmore; Dec. 18, "Testboard and Switchboard Connections and Wiring," J. Martin. 1909: Jan. 8, "Description of Underground Work, How to Change a Single Wire Overhead System to an Underground System," Mr. Gillmore; Jan. 22, "Induction, Resistance, Self-Induction and the Opposing Forces to Speech on Telephone Lines," R. Gawne; Feb. 5, "Stores, Bookkeeping," E. Cowley; Feb. 19, "Telephone Instruments, a Description of their Working Parts and Connections" (with diagrams) E. Vick; March 5, "Magneto Electricity" (with experiments), W. E. Cain; March 19, "Recording of Faults and Inspections," C. Quayle; April 2, "Office Work and its Relation to the whole of the Staffs and the System generally," W. Kelly. First meeting was held Nov. 20, eighteen members having joined (being the whole of male staff). Foreman Smith read a paper on "running wires on the twist."

The second meeting of the society was held on Dec. 4. The District Manager read a paper on "The Conversion of an Overhead Single Wire System to a Double Wire System."

Leeds.—The fourth meeting was held in the operators' dining-room on Nov. 18. A paper, entitled "Notes on Instructions to Foremen and Linemen," was read by Mr. J. E. Gillett (Local Manager). A special invitation had been extended to the outside staff, and about twenty availed themselves of the opportunity to be present. Mr. Gillett spoke on the use of augers for excavating pole holes, pointed out the importance of good punning after the erection of poles, and advocated the extended use of the pole steps as mentioned in the Book of Instructions recommending the outside staff to make a thorough study of these instructions. Mr. Gillett then dealt with the digging of stay holes, and drew attention to the importance of getting stays at the same angle along a route. In the discussion that followed several of the outside staff joined, and the following points were suggested:—The use of enamelled clips, instead of staples, for fixing the vulcanised indiarubber to arms, was suggested by Mr. Wright, one of the outside staff. The merits of copper jointing sleeves were discussed from both a favourable and unfavourable standpoint.

The fifth meeting of the session was held on Dec. 2, chairman Mr. W. V. Morten. Mr. W. M. France, of the Engineer-in-Chief's Department, gave a lecture entitled, "The Common Battery System and the Design and Lay-out of Telephone Exchanges," illustrated by lantern slides and model apparatus.

The sixth meeting of the session was held on Dec. 16, Mr. W. R. Senior being in the chair. Three short papers were submitted; the first by Mr. Taylor on the "Works Order." The second, by Mr. Fitton (read in his absence by Mr. Corlett), was on "Wayleaves." The third, by Mr. Niemann, was on "Switchboards."

Nottingham Factory.—The third meeting took place on Nov. 23, Mr. D. Macadie in the chair, 154 being present. Two half-hour papers had been arranged for. Mr. J. W. Faulkner dealt with "Common Battery Instruments," giving a detailed description of methods of dismantling wall and table sets and breast plate transmitters for the purpose of repairs, and the assembling and testing of the same, from the point of view of the practical man. Special reference was made to various transmitter faults. Mr. P. Linay's paper on "Electricity in the Workshop" was then read by the official reader, Mr. H. Wilcockson. The advantage of electricity as a power transmission agent were explained, and the necessity of controlling rheostats shown. Electric lighting, heating and ventilating, telephones, and electric calls were dealt with at some length. In the course of the discussion a number of questions were asked, and replied to by the author.

The fourth meeting was held on Dec. 7, Mr. C. E. Fenton (Factory Manager) presiding, 113 were present. Mr. F. Bardsley gave a paper on "Dynamos and Motor Construction," illustrated by a number of lantern slides. In his introduction, Mr. Bardsley explained that the subject being so vast, he would confine his remarks to the practical side only. The chief items dealt with included moulding, drilling and tapping of castings, machining of parts, boring of field magnets, building of armatures, armature winding, commutator building, and connecting up.

Oldham.—A paper was read by Mr E. Shinn upon "Overhead Construction" at a meeting of the society, held at the Café Monico, Oldham, on Nov. 26; 75 per cent. of the members were present. Mr. Shinn compared the present mode of construction with that of the past. He emphasised the necessity of lines being strengthened and stayed as the number of wires increased, and the importance of good regulation as a safeguard against faults

Newcastle District.—A branch has been started at Sunderland for Sunderland and South Shields staffs. The first meeting, for the purpose of electing officers and arranging programme, etc., was held on Nov. 6, 1908. Officers:—President, E. Spink; vice-president, W. J. Douglass; secretary and treasurer, J. Martin; committee, J. G. Dixon, Jas. Reay, A. Livingstone. Perspective membership, 27. The subscription is 1s. each (no entrance fee), and members have the use of the library at Newcastle. The meetings are to be held at the Sunderland Central premises. The programme has not yet been completed, but the following have agreed to give papers:—E. Spink, A. E. Tinwell, W. J. Douglass, A. Livingstone, J. G. Dixon, J. Reay, J. Priestman, J. Martin. The meetings are to be held on the first Friday in each month. Last session the number of members from Sunderland and South Shields was seven. Some of these members contributed papers to the programme.

The second meeting was held at Sunderland on Dec. 4, Mr. W. J. Douglass (vice-president) being in the chair. Correspondence received from the Newcastle Society was read, and considered satisfactory. Mr. R. Guthrie was proposed as a member of committee. This was carried unanimously. Two papers were given: the first by Mr. E. Spink (president), on "Simple Knots and Bends as Used by the Company's Workmen," together with a description of the theory of weight-lifting by means of blocks and ropes. The second paper was given by Mr. A. E. Tinwell, on "Electricity: Frictonal and Voltaic." There was a good attendance of members.

Liverpool and Birkenhead.—The third meeting of the session was held in the Common Hall, Hackin's Hey, on Nov. 19, Mr. E. S. Francis, vice-president, taking the chair in the absence of the president, when Mr. S. N. Aickin, Observation Clerk, read a paper on the "Observation Table."

Nottingham.—The third meeting of the present session was held in the Huntingdon Street School on Dec. 4. The evening was devoted to the operating staff, several of whom gave papers as follows:—Miss Nelson, Monitor, "Monitor's Table"; Miss Stevenson, "Operating in General"; Misses Allen and Young, "Call Offices"; Misses Green and Eddings, "Transfer Board and Measured Rates"; Misses L. Tuke and Fletcher, "Operating in General"; Misses Machin and Husbands, "Junction Board"; Messrs. Cockrem and Drake, "Enquiry Board and Testing Position"; Misses Ford and Hooley, "Training of New Operators." Prizes were given for the two best papers, the results being judged by an independent committee, who awarded Misses Green and Eddings first prize (purses) and the second prize (silver brooches) to Misses Cockrem and Drake.

Glasgow.—The second meeting of the session was held on Nov. 25, when there was a good attendance. Mr. Thyne presided. The Chairman explained that as the members knew prizes had been offered for competition in each department, and he then announced the titles of the papers which had been awarded the prizes, with the names of the authors Mr. John Stewart then read his paper upon "The Public Call Office," which took first prize in the Contract Department. Mr. Baillies, Electrical Department, next read his paper upon "Switchroom Faults." Mr. Foy's paper, which took second prize (Engineering Department), was next read upon "Insulation and Pumping of Rubber Cables." Mr. Cullen, Clerical Department, brought the proceedings to a close by reading the paper, "The Company's Outstandings Department," written in conjunction with Mr. Watt.

The third meeting was held on Dec. 9. Mr. Thyne presided, and, after a few introductory remarks, called on Mr. A. S. Duncan to deliver a paper on "Common Battery Working," supplemented by numerous diagrams and lantern slides, which materially added to its instructive character. An interesting discussion, to which Messrs. Bowie, Hale, Warnock and Allan contributed, followed.

Birmingham.—On Dec. 1 competition papers were given by three members of the staff, Messrs. Gray, Brown, and Shorthouse. The paper by Mr. Gray was on "Common Battery Working," in which the various connections of common battery lines were explained. Mr. Brown's paper, entitled "The Company and its Subscribers," was a very humorous piece of work and afforded much amusement. Mr. Shorthouse's paper, which was illustrated by slides, dealt with the "Application of the Telephone to Army Purposes." A discussion took place after each paper.

The second meeting of the session was held on Dec. 3, when Mr. Piggott delivered an address on "Operating Matters," in connection with the Midland Exchange transfer. He dealt with the various forms and records it was necessary to keep, giving particulars of each subscriber to be transferred. The lecturer also showed the various forms necessary when preparing estimates for

a proposed new exchange, giving the estimated increase in staff and office accommodation.

Engineers' Section.—An engineer's section has been formed in conjunction with the Birmingham Telephone Society. The meetings which are held on alternate Tuesdays are presided over by Mr. Baldwin (Engineer), who is giving a course of lectures on "Transmission and Development." The first meeting was held on Dec. 10, when vector diagrams were explained. The number of members enrolled in the section is 24. The following is a syllabus which it is proposed to follow as far as possible:—*Transmission.—Theory:* Consideration of the several factors governing telephonic speech, wave forms and curves; physical explanation will be emphasized; mathematical equations and proofs. *Application:* Equivalents and the use of curves; comparisons of different types of lines; compound circuits; specifications governing installation of Company's plant; attenuation; efficiency; equivalents; consideration of exchange systems; subscribers' lines; junction and trunk circuits. *Development:* Consideration of rate of past increase and its use; curves and their uses; geometric average rate of increase; percentage increase records of development; use of tables; individual study of definite localities; local knowledge of its use; special indeterminate factors affecting development, comparison of population and numbers of lines and stations; development period; manufacturing, commercial and residential districts compared; application of development studies; preparation of schemes; effect of development on telephone centres; consideration of small exchange areas; traffic considerations and the provision of junction circuits.

Cornwall.—The Truro staff, supported by the sub-centres of St. Austell and Penzance, held the inaugural meeting of their telephone society at the Truro local offices on Oct. 28. The following officers were elected:—President, Mr. G. Hooper; vice-president, Mr. J. Wilkinson; hon. secretary and treasurer, Mr. A. H. Mansfield; committee, Messrs. W. S. Griffiths, R. Harris, H. W. Roberts, G. Chapple, and F. A. Sowerby. The syllabus for the session 1908-9 is as follows:—1908: Oct. 28, "Working Expenditure," Mr. G. Hooper; Nov. 18, "Overhead and Underground Construction," Mr. W. S. Griffiths; Dec. 9, "Exchange and Instrument Faults and How to Clear them," Mr. H. W. Roberts; Dec. 30, "The Importance of Detail in Telephone Work," Mr. J. Wilkinson. 1909: "Jan. 20, "Local Centre Working," Mr. A. H. Mansfield; Feb. 10, "Exchange Fitting and Maintenance," Mr. F. A. Sowerby; March 3, "Contract Working," Mr. G. Chapple; March 24, "Line Faults," Mr. W. Pritchard; April 14, "Sub-Centre Working," Mr. R. Harris. It was decided that the membership fee should be 6*d.*, and that the management be left entirely in the hands of the committee. The president gave his opening address on Oct. 28, and showed some figures in connection with capital expenditure, which were greatly appreciated by all concerned. A discussion took place, in which several of the members present took part. The president expressed his appreciation of the fact that his local centre had floated a society and promised them every possible help to make it a success, as the distance between Plymouth and the Cornwall offices was too great to enable the staff to join the Plymouth society.

South Midland.—A general meeting was held on Dec. 14. Mr. John Mewburn, president, presided over an attendance of 25 members and ten guests. Mr. John Scott, Assistant Provincial Superintendent, Birmingham, addressed the gathering on "Notes on Management." Some of the points brought out were: (1) Management of superiors, in such things as accuracy, thoroughness, straightforwardness, obedience, politeness, and the negative side of men with grievances. (2) Management of equals. (3) Management of subordinates, with the degrees of possession of general and individual knowledge, sense of justice, firmness and force of example; concluding with the various ideas of what is meant by success. In the discussion, the following were clearly brought out:—The need of specialists, encouragement and sympathy as a help in our work. Duty should be the leading light, and the need of consistency.

Ayrshire.—The first ordinary meeting was held on Dec. 16, when the District Manager, Mr. G. A. McDonald, gave an address on "Estimates and Allocation of Expenditure." A free discussion followed, many points being elucidated. There was a good attendance.

Southern (London).—The monthly meeting was held on Nov. 24, when before a well-attended meeting Mr. Inman read a paper on "The Mercury Arc Rectifier." After a detailed description of the apparatus as fitted at the Deptford Exchange, came a description of its mode of operation. An addition of 23 volumes has been made to the library of this society, which now consists of nearly 80 books.

Swansea.—The second meeting of the society was held on Nov. 13, when a paper was given by Mr. Napier (Engineer-in-Chief's staff) on "Traffic," illustrated by lantern slides. The meeting was arranged as a joint meeting for members of the general society and of the operators' society.

The third meeting took place on Dec. 16, when Mr. W. Howells (Contract Officer, Swansea) gave a paper on "Telegraphy—Its Working Illustrated and Comparisons Drawn with Telephony," the comparison between the two systems causing a very animated discussion. The lecturer's reminiscences of the old days of the telegraph were keenly enjoyed.

Swansea Operators.—The third meeting was held on Dec. 9, when a paper was given by Mr. A. E. Coombs (Exchange Manager, Bristol) on "Impressions of the Telephone Service." There was a good attendance—80 per cent. of the members being present in addition to fifteen visitors. The chair was occupied by Mr. W. E. Gauntlett (District Manager), present also being Mr. R. A. Dalzell (Provincial Superintendent).

Dover.—The second meeting was held in the district offices, Dover, on Nov. 27, when a paper was given by Mr. P. C. Langridge on the subject of "Testing Instruments." A number of practical demonstrations with a Wheatstone bridge testing set added to the interest of the lecture. Fifty-four of the members were present and four visitors.

Bristol Operators.—The third meeting was held on Dec. 17, when a paper was given by Miss F. Nicholls (Clerk-in-Charge) on "Team Work and Supervision." There was an excellent attendance representing 90 per cent. The lecturer dealt at length with the advantages to be secured from team work properly carried out. Six short papers were read by the Chief Supervisor (Miss Smith) and the captains of the various teams, Misses FitxGibbon, Short, Manning, Harvey and Etches, confirming the lecturers' statement. At the close of the meeting Miss Smith, on behalf of the operating staff, presented Miss Nicholls with a handsome bouquet as a token of their appreciation of her efforts towards such an instructive and entertaining meeting. The District Manager, Mr. A. Perkins, presided.

Tunbridge Wells.—A telephone society has been formed at Tunbridge Wells. Mr. C. J. Phillips, Provincial Superintendent, has consented to become hon. president; Mr. S. C. Smith, District Manager, president; and Mr. A. L. Curling, Local Manager, vice-president. The opening of the session took place at Ralph's Restaurant on Dec. 8, when Mr. Phillips gave his interesting lecture entitled "Telephone Reminiscences."

Wolverhampton.—The second meeting was held on Nov. 20, the chair being taken by Mr. Archer W. Smith, when a paper was read by Mr. F. G. C. Baldwin, of Birmingham, on "Transmission." The number present was 67.

An auxiliary meeting was held at Walsall on Dec. 11, with Mr. Archer W. Smith, District Manager, in the chair. Papers were read by Mr. F. Adcock, Senior Inspector, and Mr. W. Hassell, Lineman Inspector, on "Instrument and Switchboard Faults" and "Line Maintenance" respectively. There was a gathering of 36, including a number from Wolverhampton.

Bolton.—The first meeting of the session took place on Nov. 19. Mr Haley, District Manager, gave a short presidential address, and was followed by Mr. A. Magnall, Chief Engineer, Manchester, with a lecture entitled "Engineering Notes." The lecture was illustrated by lantern. The best methods of block wiring and undergrounding were fully brought out, and the exercise of foresight in avoidance of undue risk to life and property was dwelt on.

The second meeting was held on Dec. 10, Mr. A. N. Entwistle, Chief Clerk, being in the chair. Mr. S. N. Aicken, Observation Clerk, of Liverpool, gave a lecture on "Service Observation." The analysis of the records and description of the curves showed very forcibly the great improvement in the service to which observation may lead. The syllabus for 1909 is given below, and the session promises to be a most successful one:—1909: Jan. 14, "Junctions" (illustrated by lantern), Mr. Staite, Manchester; Feb. 11, "Prospect and Retrospect of Telephony" (illustrated by lantern), Mr. T. A. Prout, Liverpool; March 11, "Wireless Telegraphy," Mr. Drysdale, Liverpool; April 8, prizes for two best ten minutes' papers, members' night and general meeting.

Leicester.—A meeting was held on Nov. 27, 63 per cent. of the members being present. The chair was taken by Mr. F. H. Tyas, vice-president. The speaker, Mr A. Magnall, of Manchester, gave a lecture entitled "Pages from a Note Book," which was full of practical information. He was able to give the benefit of his experience of covered distribution in Manchester, and by the aid of a series of lantern slides and samples of apparatus, fully explained the details of the system.

On Dec. 11 the members had the opportunity of giving a hearty welcome to Mr. John Scott, Assistant Midland Provincial Superintendent—this being his first visit to the society. The subject of his address was "Some Notes on Management."

Brighton.—On Dec. 16 a paper was read by Mr. D. Wallace, Contract Manager, Brighton, on "The Vicissitudes of Contract Work." Mr. C. F. Moorhouse, District Manager, presided.

Glasgow Operators.—The second meeting was held on Nov. 23, Mrs. B. M. Peters, Matron, occupied the chair. Miss Jamieson, of the Calls Department, gave a paper on "How Call Tickets are Dealt with in the Calls Office." She described the various processes gone through, drawing particular attention to the various details to be observed, and bringing out the absolute need for legibility. She stated that approximately three-quarters of a million (equal to 3 cwts.) of tickets were handled in a month.

Birmingham Operators.—The third meeting of the session was held on Dec. 10, the chair being taken by Mr. L. Crecraft, Exchange Manager, Midland Exchange. A paper was read by Miss H. Crowther, Supervisor, Central Exchange, on "Operating the Measured Rate Service," which was well thought out and excellently read. The points chiefly dealt with were—Code for marking indicators and opals; private branch exchange operating; call office operating; the use and care of tickets; careful supervision of the calls.

Warrington.—The third meeting was held on Dec. 18, and presided over by the District Manager, Mr. H. Chambers. Mr J. H. Langley delivered a lengthy paper, illustrated by limelight views, on "The Small Power Plant." Mr. A. Spargo gave a paper on the "Planning and Laying of an Underground Scheme," particularly dealing on the methods now employed in constructing this particular class of work.

Bradford.—The monthly meeting was held on Dec. 9; 65 per cent. of the members were present. Papers were given by members of the Keighley staff, Mr. F. Baslow dealing with "Past and Present Telephony," Mr. T. R. Coates following with a paper on "Party Line Working," and Mr. F. N. Powell dealing with "Primary Batteries." Mr. R. Norton, chief Foreman, dealt with "Telephone Reminiscences."

Bristol.—The second meeting of the session was held on Dec. 12, when Mr. Hare, the Assistant General Superintendent, read a paper on "Capital." The scope of his paper was so comprehensive that the members of every department found themselves interested. The discussion that followed after was prolonged and animated, and Mr. R. A. Dalzell presided. There was an attendance of 63 per cent. of the members; five visitors were also present.

Another meeting was held on Dec. 17, when Mr. W. C. Owen, the Local Manager at Bath, gave a lecture on the "Rudiments of Telephone Line Construction." He explained in his opening statement that his object was not to read a learned paper on engineering, but to give some general information which would

be of interest to all branches of the staff and generally to give some hints which would be useful to the younger members of the engineering staff.

Cork.—At a largely attended meeting of the society held on Nov. 20, the President (Mr. A. M. Kidd, District Manager), delivered the presidential address. Amongst other matters touched on, the speaker referred to the development generally of the telephone service in recent years, and to the advancement of the Company's business in the South of Ireland district, and pointed to the increase of the number of exchanges in the district as eighteen. Before the meeting came to a close it was decided to form a benevolent society in the district, and to have the necessary rules drawn up for submission to the next meeting.

Plymouth.—A meeting took place on Dec. 14, over which Mr. Hooper, District Manager, presided. The lecture was by Mr. B. S. Cohen on "Transmission," and was illustrated by lantern slides, which showed some interesting pictures of speech waves and apparatus used for experiments; 80 per cent. of the members were present. The meetings of this society are three-weekly, and not fortnightly as stated in last month's JOURNAL.

Luton.—Mr. H. G. Smith, Inspector-in-Charge at St. Albans, read a paper on Nov. 19 entitled "Inspections." Only a small percentage of members were present under the chairmanship of Mr. J. H. Wilson, but an interesting discussion on points arising out of the paper took place.

Exeter.—Mr. H. Reid presided over a well-attended meeting held on Dec. 8. Mr. F. Michaelson gave a paper on "The Construction and Maintenance of Switchboards." Various questions were asked, and a general discussion ensued.

Cardiff Operators.—The monthly meeting was held on Dec. 15. A paper entitled "Are Operators mere Machines?" was given by Miss B. W. Williams. It was clearly pointed out that, although to a certain extent, operators are machines in so far as the ordinary routine of operating is concerned, still they are by no means "mere" machines—they have to use their brains as well as their hands and tongues.

Greenock.—The third meeting of this society was held on Dec. 2. Mr. A. Ramsay Lamb, District Manager, presided over a good attendance of members, and Mr. A. Bucklitsch read a paper on "Electrical Testing." The lecturer described fully the action of an electric current on a small magnetic needle, the ordinary galvanometer, testing voltmeter, mirror galvanometer, Wheatstone bridge, Silverton test set and shunts and their use. The lecture was fully illustrated by about twenty lantern slides (prepared by Mr. J. McClintock, who also operated the lantern).

Hull.—The subject of the paper by Mr. J. T. Tattersall, at the fourth meeting of this session, held on Nov. 20, was "Aerial Line Construction," and this commanded a good attendance of members. Mr. C. C. Worte presided.

At the fifth meeting, two papers were given; one by Miss Roach on "Duties of a Supervisor," and the other by Mr. W. Sanderson on "Observations of Wayleave Officers." The paper given by Miss Roach is the first to be given by a lady member of the society, and it was very well received. Mr. Sanderson's paper proved very racy, including many anecdotes of cases that had arisen during his duties. He also dealt with obstacles to be overcome, best positions for fixings and poles, going carefully through the duties of a wayleave officer.

Blackburn.—The second meeting of the session was held on Nov. 20, when Mr. Airey (Cost Clerk), Blackburn, read a paper entitled "Co-operation." The essayist treated the matter in a very broad light, and advocated co-operation amongst the staff generally, showing the benefits that would accrue from a system of co-operation among the engineering, electrical and clerical staffs. Mr. Lightbown, of the Burnley local office, was deputised to criticise the paper, and agreed generally with Mr. Airey on the principal points.

The third meeting was held on Dec. 18, when Mr. Storey, Accrington, gave a paper on "Maintenance." He gave some interesting details of tests he had made of various cells used by the Company in order to prove their efficiency, and the results were shown in diagrammatical form. Mr. Chambers, Burnley, criticised the paper, and afterwards a very keen discussion followed, which only terminated when it was absolutely necessary for the members from the out-centres to leave in order to get their trains.

Sheffield.—On Dec. 11 Mr. C. Marsden read his paper on "Underground Construction." Having dealt with the various annual charges for open wires, aerial cables and underground cables, the lecturer went on to describe the various methods of cable distribution, and showed how the testing method is more elastic than the older "tapering" arrangement. The various processes of pipe laying and jointing, also of cable jointing, were illustrated and explained. After which the necessity for careful handling in connection with dry-core cable was mentioned, the lecturer pointing out how neglect on this score may be cause of numerous troubles.

London.—The second meeting of the above session was held at Salisbury House on Nov. 30. There was an attendance of 196 members, the president, Mr. H. Davis, being in the chair. Mr. J. Stirling read a paper entitled "Some Business Troubles and Suggestions." Some of the principal troubles mentioned went to show that seemingly trivial omissions on the part of not only responsible officers but their juniors, often were the cause of serious trouble and the source of annoyance to the public, needless correspondence, and either direct or indirect loss to the Company. At the conclusion, the following members took part in the debate:—Messrs. A. Gray, F. Gill, G. F. Greenham, J. F. Edmunds, H. Corner, L. H. Lowe, W. T. Glenny, E. Everett, and C. Drabwell. Mr. F. Gill in the course of his remarks asked if it were not possible for the society to arrange for some lectures of an elementary nature, and to this Mr. J. Stirling replied that the committee had already discussed the question, and that they hoped shortly to publish the result of their decision.

STAFF GATHERINGS AND SPORTS.

The Telephonic Masonic Lodge.—An emergency meeting of this very successful lodge was held on Dec. 12, at the Gaiety Restaurant, Strand, under the presidency of the Worshipful Master, Bro. F. O. Harke. There was a heavy agenda; the Master Mason's degree was conferred on Bros. V. Baldwin, Dudley Stuart, C. W. Salmon, Charles Edwards and W. Aitken; and Bros. H. J. Dunstan, F. W. Hibberd, R. J. Payne, F. H. Blackford and E. A. Laidlaw were advanced; Messrs. G. H. Goldsmith, F. C. Hawker, W. V. Pegden, C. Elliott and J. A. Hunt being initiated. Bro. J. E. Hood, of the Electric Lodge, was elected a joining member. The following candidates were unanimously approved for initiation at a subsequent meeting:—Messrs. J. M. Shackleton, F. W. Francis, H. J. Maclure, Arthur Watts and C. F. Street. The visitors present included W. Bros. J. Levy, P.P.G.J.W., Notts; Thos. Caparn, P.P.G.S.D., Hants; Dr. A. Phillips Hills, P.P.G.S.B., Herts; E. Burritt Lane, L.R.; S. J. Norton; Bros. M. J. Manning, P. V. Dowson, and W. Bro. Harby. The latter made a very handsome presentation to the lodge equipment in the shape of a hand-beaten copper alms plate, bearing the badge of the lodge.

Sheffield.—The debating class of the Sheffield Contract Department held a very successful whist drive and dance in the Imperial Rooms, Pinstone Street, Sheffield, on Dec. 9. A company of nearly 200 of the staff and friends attended. The District Manager, Mr. R. C. Bennett, was also present during the evening.

Bournemouth.—The second annual staff social was held at the Quadrant Restaurant on Nov. 27. A thoroughly enjoyable evening was spent, the programme consisting of songs by the Misses Guy and Brown, comic selection by Mr. B. Squires, and numerous games and dances. Mr. R. Ford acted as accompanist, and there was a good attendance.

Edinburgh.—The second whist drive of the season took place on Dec. 12. There were 52 players. The prizes went to Miss F. McLauchlan, Mr. Radcliffe (Post Office inventory staff) and Mr. C. L. Stewart, and were presented by Mrs. J. D. W. Stewart.

Keighley.—The third annual whist drive and dance was held on Dec. 1. There was an attendance of about 80. The whist prizes were won as follows:—Ladies: 1, Miss Merrall (jam dish); 2, Miss A. Dixon (chatelaine bag); consolation, Miss Musgrave. Gentlemen: 1, Mr. Wilkins (silver-mounted malacca cane); 2, Mr. A. Murgatroyd (box of cigarettes); consolation, Mr. J. Wood. Following the whist drive dancing was kept up till a late hour.

Glasgow.—The annual dance was held in the Prince of Wales's Hall, Sauchiehall Street, on Dec. 10. About 70 couples were present, and a thoroughly enjoyable evening was spent; the music being provided by a quartette from the band of the 2nd K.O.S.B.

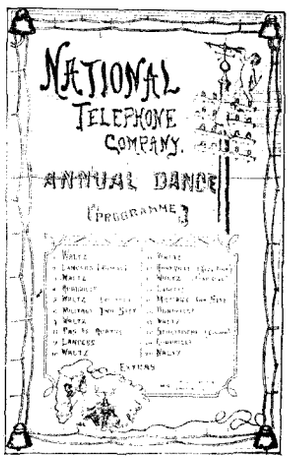
Norwich.—A successful whist drive was arranged by Messrs. Pratt & Wigg on Nov. 20 at the Criterion Restaurant, 120 players were present, 30 tables being set. Twelve prizes were offered, divided equally between ladies and gentlemen. The first prizes were won respectively by Miss Wilson and Mr. A. H. Clarke.

Birmingham.—The following social events are announced:—On Jan. 8 at 7.30 p.m. a whist drive in connection with the Birmingham Telephone Society will be held at Fletcher's Restaurant, Corporation Street. Tickets 1s. each. On Saturday, Jan. 16, the inspectors hold their annual dinner. The great social event of the season, however, is the annual ball, which will again be held in the Grosvenor Rooms, at the Grand Hotel, on Saturday, Feb. 6. Ladies' tickets, 4s.; Gentlemen's tickets, 5s. each.

Ashton-under-Lyne.—A very successful whist drive and dance was held on Nov. 27, at which a large number of the staff and friends assembled.

Oldham.—The operating staff held their first whist drive of the season at the Reform Club, on Dec. 5. Refreshments were provided about 9.30 p.m., after which dancing was conducted up to 12 p.m. There were twenty tables for whist. Mr. Blackburn of the Oldham district office acted as master of ceremonies throughout the evening, while all the arrangements for refreshments were provided for by the Oldham operating staff.

Paisley.—The third annual dance of the Paisley staff was brought off most successfully in the Art Gallery of the Geo. A. Clark Town Hall on Nov. 27, some 40 couples taking part, among whom were Mr. Lamb, District Manager, Greenock, and Mrs. Lamb, Mr. Audsley, Local Manager, Paisley, and representatives from Glasgow and Greenock. It was decided not to have individual programmes on this occasion, but to have four wall programmes, designed by Mr. J. McClintock, Draughtsman at the district office, Greenock, a reproduction of one of which we publish. Dancing was commenced at 8 p.m., and was kept up with vigour until 2.30 a.m.



Wolverhampton.—On Dec. 1 the Wolverhampton district operators, together with those from adjoining exchanges, held a social evening and dance in the Whitmore Assembly Rooms, Wolverhampton. The District Manager, Mr. Archer W. Smith, was present, also the Local Manager, Mr. C. H. Redhead, together with numerous friends, and a very enjoyable evening was spent.

Liverpool.—*Royal Exchange Whist Drive.*—A successful whist drive was held at the Ceylon Café in Old Hall Street on Dec. 5, 140 members of the staff and their friends were present. Among the prize winners was Miss J. Hughes, Supervisor, Royal Exchange.

Maidstone.—The Maidstone staff visited Tunbridge Wells on Dec. 12, having accepted an invitation to play a football match with the local staff. The weather was fine, and a good game resulted, although the ground was rather soft. The result was—Maidstone 3, Tunbridge Wells *nil*. Mr. S. C. Smith, District Manager, and Mr. A. L. Curling, Local Manager, were among the interested spectators. After the match, over 50 of the staff sat down to tea, which was followed by an enjoyable concert.

Leicester.—The operators held a very successful whist drive on Dec. 7, at

the Oriental Café, with the object of providing, as did the Birmingham operators, decorations for their retiring rooms. There were 122 at the tables, and the management reflect much credit on the organisers, Miss Law (Chief Operator) and her committee of operators. Mr. Bailey was M.C.

London.—The *Eastern* district staff held a social evening at the Passmore Edwards' Sailors' Palace, on Nov. 18, under the chairmanship of Mr. C. E. Tattersall, who was supported by Messrs. Edmonds, Elliott, and Stirling. Over 150 members of the staff and friends were present. An excellent musical programme was carried out. The most interesting feature of the proceedings was the presentation to Mr. P. G. Head (the late Exchange Manager) of a travelling rug and umbrella, as a mark of the respect and esteem in which he is held by all members of the Eastern district staff. Mr. Edmonds made the presentation, and referred to the valuable service rendered by the recipient. Mr. Head suitably responded. The whole of the arrangements were admirably carried out by Mr. A. E. M. Mitchell and his energetic committee.

The traffic staff of the *Bank* Exchange held their first progressive whist party (session 1908-9) on Dec. 10. A very enjoyable evening was spent by those present, and the prizes (two of which were given by Miss Minter, hon. secretary to the staff hospital collections, and Miss Ralph respectively) were presented by the Traffic Manager. The party was held in aid of the Hospital Saturday Fund and resulted in the sum of £2 10s. being raised to swell the Company's donations to this very desirable object. The committee would like to take this opportunity of thanking those friends who gave them their support, and also have pleasure in announcing that their next whist drive will be held at Ye Mecca Café, 56, Ludgate Hill, E.C., on Feb. 4 in aid of the Fresh Air Fund.

Chess Club.—Greater success has been met with in the last two matches played in connection with the Civil Service and Municipal Chess League, which resulted as follows :—

	Points. For.	Against.
Nov. 24. *v.* Metropolitan Water Board (away) ..	5	5
Dec. 15. *v.* Paymaster-General's Office (home) ..	5½	4½

The individual scores for these matches were as follows :—

v. Metropolitan Water Board.

	N. T. C. C.		*M. W. B.*	
1.	Mr. L. Harvey Lowe (by default)	1	Mr. J. F. Allcock	0
2.	,, F. G. Margetson	1	,, W. T. O. Angel	0
3.	,, Eustace Hare	0	,, H. W. Dunnett	1
4.	,, P. Chester	1	,, E. A. Collins	0
5.	,, A. O. Tame	1	,, G. H. Ashberg	0
6.	,, G. Bean	1	,, R. L. Woollacott	0
7.	,, Robt. P. Lowe	0	,, J. W. Drinkwater	1
8.	,, J. R. Milnes	0	,, E. A. Phillips	1
9.	,, R. H. Carter	0	,, J. H. Edwards	1
10.	,, W. B. Benham	0	,, M. H. Piggott..	1
		5		5

v. Paymaster-General's Office.

	N. T. C. C.		*P.-G. O.*	
1.	Mr. J. Holden	0	Mr. J Mahood	1
2.	,, F. G. Margetson	*½	,, R. C. Taylor	½
3.	,, P. Chester	½	,, E. A. Eager	½
4.	,, Eustace Hare	0	,, F. W. Luck	1
5.	,, A. O. Tame	1	,, W. H. Mounder	0
6.	,, G. Bean	½	,, L. J. Baker	½
7.	,, Robt. P. Lowe	*1	,, R. H. Sandes	0
8.	,, J. R. Milnes	1	,, A. M. Johnson	0
9.	,, W. A. Sullivan	1	,, J. B. Denny	0
10.	,, W. E. Weston	*0	,, J. S. McIntyre	1
	* Adjudicated.	5½		4½

The secretary would be pleased to hear from any provincial telephone chess club with a view to arranging matches, and would welcome any player at the club's commodious headquarters, Ye Mecca, 56, Ludgate Hill, E.C. The club meets every Tuesday from 6 to 9.30 p.m.

NEWS OF THE STAFF.

Mr. C. G. RANSLEY has been appointed District Manager at Guildford in which capacity he has been acting for the last six months. The position is not altogether new to him as for some years he held the post of District Manager, Northern district, London, until the re-organisation of the London staff, when he was appointed a Divisional Engineer. He has already completed over 28 years' service, and the staff with whom he has come in contact with during that period will wish him success in his new sphere.

C. G. RANSLEY.

Mr. L. CRECRAFT, Assistant Exchange Manager, Central, has been placed in charge of the new Midland Exchange, Birmingham.

Miss E. ADAMS has been transferred from School Teacher to Clerk-in-Charge, Midland Exchange.

Miss M. G. BILLINGTON has been transferred from Monitor, Central, Birmingham, to School Teacher, Midland Exchange.

Miss F. J. WILLIAMS, who has for some time past been visiting the Birmingham sub and branch exchanges, has been promoted to be Visiting Matron, Midland Exchange. As a mark of esteem and goodwill for her work in connection with these exchanges the operators at the sub-exchanges have presented her with a silver manicure set, and those at the branch exchanges with a gold bangle.

Miss E. BLUCK has resigned her position as Supervisor after nine years' service with the Company. The members of the Birmingham operating staff presented her with a handbag and silver hatpin stand.

Miss H. CROWTHER, Supervisor, has been transferred as Supervisor-in-Charge to East Exchange, Birmingham.

Miss L. MITCHELL, Operator, has been ppointed Clerk-in-Charge at Middlesbrough Exchange, vice Miss J. Trubshaw resigned.

Mr. C. H. REDHEAD, late Local Manager at Wolverhampton, was presented by the district staff on Dec. 17 with a breakfast dish on his promotion to Engineer at Dublin. The presentation was made by the District Manager, Mr. Archer W. Smith, with a suitable address. Other members of the staff also spoke of the high esteem in which Mr. Redhead had been held, and the latter feelingly acknowledged the present and also the good wishes accompanying it.

Mr. E. J. JARRETT has been appointed Loca. Manager at Wolverhampton in place of Mr. Redhead promoted to Dublin.

Mr. W. HIGSON, of the Bolton electrical staff, has been transferred to Dublin as Inspector. Mr. Higson was presented by the staff with a Gladstone bag. Mr. Haley, District Manager, in making the presentation, referred to Mr. Higson's valued services as secretary of the Bolton Telephone Society.

Mr. F. RATCLIFFE, Switchboard Inspector, Bolton, has been appointed Lecturer in Telephony at the Bolton Technical School, vice Mr. Higson.

Miss A. TAYLOR, Junior Operator, Liverpool, who resigned on Nov. 19, was presented with a gold brooch.

Inspector L. G. ALLEN, on his transfer from Cheltenham to Dublin, as Fault Inspector, was presented with a set of silver plates, forks and spoons, a pipe, and a case of cigarettes.

Miss GRACE ANDERSON, Senior Operator, Royal Exchange, Glasgow, left the Company's service on Dec. 10 to go abroad. She was presented with a curb bangle and lace brooch set with pearls by the staff in her exchange.

Mr. A. L. JONES, Test Clerk, Swansea, who has resigned the service, was presented, on leaving, with a serviceable travelling bag.

Miss RUTH RALPHS, Operator, Bolton, has resigned the Company's service to take up a similar position with the Post Office. Miss Ralphs was presented with a gold locket by the switchroom staff.

Mr. F. S. BAGLOW was presented with a shaving set by the North Devon staff on his being transferred from Barnstaple local office to the district office at Exeter.

Mr. R. MORGAN, Exchange Manager, Hull, has been transferred to Dublin as Exchange Manager.

Mr. G. R. HILL, Observation Officer, Hull, has been promoted to be Exchange Manager.

Miss BEATRICE ROSS, Junior Operator, Edinburgh Central, on resigning was presented by her fellow operators with a silver-backed brush and comb.

Miss MARY BOWDEN, Senior Operator, Todmorden, resigned on Nov. 19, The staff presented her with a flower stand as a mark of esteem.

Metropolitan Electrical Staff.—The following transfers have been made :—

Mr. F. O. STEED, Exchange Electrician, from Gerrard to the Metropolitan engineers' staff.

Mr. J. H. STEWART, Exchange Electrician, Paddington, to be Exchange Electrician, Gerrard.

Mr. R. DRURY, Exchange Electrician, Westminster, to be Exchange Electrician, Paddington.

Mr. W. HILLS, Exchange Inspector, Gerrard, promoted to the position of Exchange Electrician, Westminster.

Mr. JAMES W. MCLEISH, on his recent transfer from Battersea to Kensington, was presented by his colleagues on the staff with a silver-mounted crocodile pocket wallet.

Mr. F. MORLEY WARD, on being transferred from Brixton to East, was presented by his friends among the staff with Abbott's *Telephony* in six volumes.

Miss ETHEL SOWERBY, on her promotion from Battersea to Streatham, as Supervisor on probation, was given a silver-mounted salad bowl by her Battersea friends.

City and Guilds of London Institute.—In recent examinations, the following passes were secured by members of the Company's staff :—

Mr. H. C. DAVIDSON, Chief Inspector, Great Yarmouth, Telephony, honours grade, 1st class.

Mr. E. YORKE STARKEY, Engineering Inspector, Great Yarmouth, Telephony, ordinary grade, 2nd class.

Mr. F. W. LANE, Brighton, 2nd class, ordinary.

Mr. C. HOOPER, Brighton, 2nd class, ordinary.

Mr. H. HATTON, Brighton, 2nd class honours.

Metropolitan Traffic Department.—*Promotions and Transfers :*

Miss DAISY WRIGHT, Operator, Gerrard, has been promoted to be Supervisor, Bank.

Miss FLORENCE MOORE, Operator, Dalston, has been promoted to be Supervisor, London Wall.

Miss EMMA STEVENS, Operator, Brixton, has been promoted to be Supervisor, Hop.

Miss FLORENCE STRUTT, Supervisor, Dalston, has been promoted to be Senior Supervisor at the same exchange.

On the occasion of Miss BESSIE EVANS, Operator, Gerrard, being transferred to Newport (Mon), she was presented by the operators at Gerrard Exchange with a brooch.

MARRIAGES.

Miss A. JENSEN, Senior Operator, Royal Exchange, Liverpool, who resigned on Oct. 12 last to be married, was presented with a dinner service by the operating staff.

Miss J. TRUBSHAW, Clerk-in-Charge, Middlesbrough Exchange, resigned on Nov. 26 after sixteen years' service, in view of her approaching marriage. Prior to leaving, the District Manager (Mr. J. W. Swithinbank), on behalf of the Middlesbrough centre staff, presented Miss Trubshaw with a set of cutlery as a token of their appreciation of her and of their good wishes.

Miss E. ATKINSON, Test Operator, Royal Exchange, Liverpool, resigned on Dec. 3 prior to her departure for America, where she is to be married. She was, before leaving, the recipient of many handsome presents from different members of the staff. Amongst the many presents were the following:—From the operators, set of cutlery; from the district inspectors, cruet; from the switchroom and testroom inspectors, set of carvers. Also several inspectors sent a flower epergne.

Miss E. STOCKER, Senior Operator at Royal Exchange, Liverpool, resigned on Nov. 19 to be married. Miss Stocker, who had been recently transferred from the Central Exchange, was presented with a pair of Royal Worcester vases from the Central operating staff, and a table lamp from the Royal operating staff.

Miss G. HAGUE, Senior Operator, Sheffield, resigned, in view of her approaching marriage, after ten years' service with the Company. The operating staff presented her with a case of tea knives.

Mr. ROBERT C. WILSON, Chief Clerk, Edinburgh, is to be married on Jan. 1. On Dec. 18, at a largely attended meeting of the staff, Mr. J. D. W. Stewart, District Manager, presented him on their behalf with a marble clock, side ornaments, and a set of military brushes, and with a pearl and peridot pendant with chain for his bride, Miss DOUGLAS. In doing so, he conveyed the sincerest good wishes of the staff for their happiness. Mr. Wilson suitably replied. The same evening Mr. Wilson was entertained at a smoking concert, at which over 70 (members of the staff and friends) were present.

Miss A. GRIEVE, Operator-in-Charge, Lowestoft, resigned, in view of her forthcoming marriage on Dec. 19, after ten years' service.

Miss STUART MILNE, Senior Operator, Govan Exchange, left the Company's service on Dec. 3, to be married. She was presented with a silver fruit stand by the operators in that exchange.

Mr. W. CASTLETON, Local Manager, Scarborough, was the recipient of a satin eider down quilt given by the staff on the occasion of his marriage on Oct. 31, with the Chief Operator, Post Office, Scarborough, who was also presented by the operating staff of the National Telephone Company with an ivory bound silver-mounted prayer book.

Mr. TAYLOR, Inspector, Bury, was presented with a marble timepiece on the occasion of his marriage. The presentation with suitable expression of good wishes on behalf of the Bury and Bacup staff was made by Mr. Whittaker, Chief Inspector, Bury.

Metropolitan Traffic Department.—*Leaving to be married:*

Miss BEATRICE MASON, Operator, Gerrard, on resigning to be married, was presented with a tea service by the staff.

Miss KATHLEEN TYLER, on leaving the Bank Exchange to be married, was presented by her colleagues with a tea service.

OBITUARY.

Miss KATE MULLOY, resident caretaker and operator at Prescot for the past eighteen years, passed away on Dec. 3. She succumbed to a tumour, which had been affecting her health for the past two years. A wreath was sent by the local office staff at St. Helen's as a token of their sympathy.

The late Gunner WATSON, a wireman in the Bolton district, who joined the 9th Lancashire Artillery in 1889, and transferred to the 18th Lancashire Battery last year, when the Territorial Artillery was formed, was interred at Tonge Cemetery on Wednesday afternoon. The funeral was attended by Major C. E. Walker, Lieut. Joseph Nall, and a party of non-commissioned officers and men of the battery, also by a few members of the Fire Brigade. The coffin, covered by the Union Jack, was conveyed to the cemetery on an artillery gun-carriage, drawn by six horses, and driven by the deceased gunner's comrades. At the graveside the trumpeters sounded the "Last Post" on the conclusion of the burial service.

We regret to announce the death of Foreman H. STOKES on Dec. 9 after a long and very painful illness. He was in the employ of the Company for seven years, and during the last three years acted as foreman in the Dudley centre.

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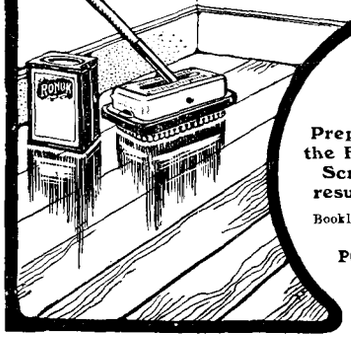

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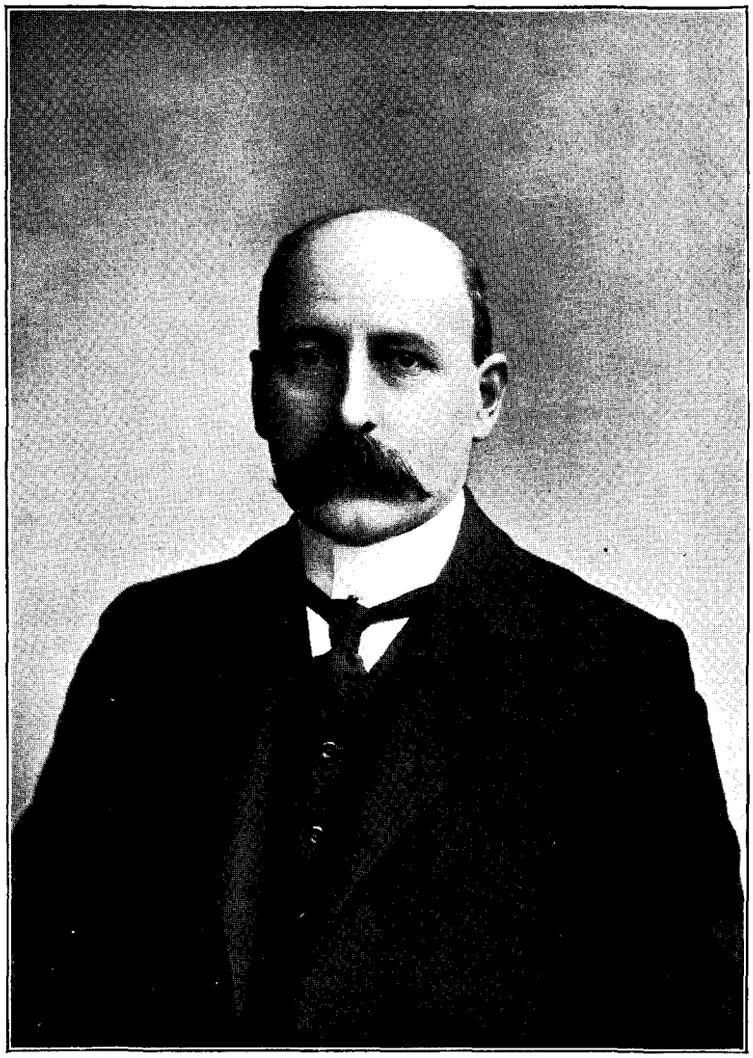
TELEPHONE MEN.

XXXIII.—ROBERT SHEPHERD.

ROBERT SHEPHERD was born in 1860 at Holywood, co. Down, educated at Hillbrook School, Holywood, Queen's College, Belfast, and Edinburgh University. His first introduction to the telephone was in the autumn of 1879—in Edinburgh—where an exchange had just been started, and in February, 1880, he joined the Scottish Telephonic Exchange, Limited. He was then sent to Belfast with the late Wm. L. Hill to open the first telephone exchange in Ireland. In 1881 he was appointed Assistant Engineer, and passed into the service of the National Telephone Company when that Company took over the business of the Scottish Company and the United Telephone Company, after an active competition between the two latter had resulted in the victory of the Scottish. Mr. Shepherd's father was, at the time, the superintendent for Ulster of the Scottish Company. In June, 1881, Mr. Shepherd was sent to Italy for the Anglo-Continental Telephone Company and commenced work in Turin. A few months afterwards he was transferred to Florence, where he opened an exchange in the face of active opposition from an Italian Company already on the ground. In fact, there were at that time three companies in evidence in Italy, but one of them never did any actual work.



The work of pioneering the telephone both in Ireland and in Italy was fraught with immense interest and not wanting in its humorous side. In Italy Mr. Shepherd had to train his own men, none of them having ever had any telegraph experience. He had to design his own insulators and have them made, as it did not pay to send heavy stores from England. He had to make drawings of any bolt or piece of ironwork that was used, and he spent weeks in the blazing sun on housetops teaching the men to coil out, vice up, bind in, etc., wires; in fact, every detail had to be taught and many were the difficulties that had to be overcome.

In 1884 the Anglo-Continental Company was amalgamated with a portion of the Italian Company, and the exchanges in Florence, Bologna, Leghorn and the adjoining country were formed into a new company, managed by an Italian board of directors. Mr. Shepherd was appointed valuer for the English shareholders, and was given the supervision of the technical work in all the towns. His appointment, originally for one year, was extended to fifteen months after which he returned to England. The late Col. R. R. Jackson then introduced him into the newly formed South of England Company, and within ten days of his arrival in England he was sent to Cambridge to break perfectly new ground. It was no easy matter to introduce the telephone exchange system into so conservative a place as Cambridge, but by the aid of friends both in the town and the 'Varsity he was able to gain an entry and very soon there was a serviceable exchange working. Probably the private branch exchanges opened in 1885—in Caius and other colleges—were amongst the earliest in the country. The main circuit to the exchange was taken to a switchboard in the porter's lodge, and extensions (at, we believe, £5 a year each) were carried into the various departments of the college and the rooms of tutors, fellows and others.

In 1886 Mr. Shepherd resigned his appointment and was immediately re-engaged by the National Telephone Company and placed in charge of the Ulster district at Belfast. His managership in Ireland lasted exactly ten years, and during that time, of course, he saw very great changes. The old "Jones" switchboard—made up in sections for 50 lines, with a special ringing device for each individual line which at the same time replaced the indicator, and a system of transfer wires between board and board, such wires being attached to small brass plates about ½-inch square, with a hole drilled in the middle to take the plug (one can imagine what the contact was like when

the holes got worn!)—was soon replaced by one of the earliest type of multiple board. Various small exchanges were opened and, with the valuable assistance of Mr. James Stewart, exchanges established at Londonderry and Strabane, the two places being joined up by junction wires. The Duke of Abercorn was much interested in this, and formally opened the service by sending the first public message over the lines.

On the death, in 1896, of Mr. Calder, Metropolitan Superintendent, and the subsequent division of the Southern Province into two parts, Mr. Shepherd was appointed Superintendent of the newly formed Western Province, remaining in that position for nine years, which he looks back upon with pleasant recollections.

When the superintendence of the North-West was about to become vacant on the retirement of Mr. R. H. Claxton, the Board appointed Mr. Shepherd to that responsible post.

For 29 years he has been a devotee of the telephone, and his quiet and unobtruding manner has earned for him an amount of appreciation and affection from all classes of the staff, which has in the past year been most markedly displayed in the great loss Mr. Shepherd suffered in the death of his wife. The marks of sympathy which he then received were heartfelt and were very deeply appreciated by him, and perhaps he felt the sympathy more from the knowledge of the respect in which he was held by such a large number of the Company's servants. At the time of his bereavement it was to Mr. Shepherd a source of consolation that his only son (who is in the Company's service on the engineering side) was able to be with him, and there cannot be many cases extant where one family has for three generations supplied servants to the Company.

SOME OPERATING POINTS.

By J. H. SWAIN, *Exchange Manager, Liverpool.*

THOSE familiar with operating statistics will have noticed the enormous increase in the number of calls dealt with in the various exchanges of over 300 lines during the past five years, showing the development of the telephone industry of this country, and it is, therefore, very necessary that the organisation and machinery for dealing with this 57 per cent. increased traffic, must be of a high efficiency if the service is to be of that value which modern business methods demand.

In these days of keen competition, the average subscriber depends on his telephone for the successful conduct of his business, and is far more exacting in his requirements for good service than formerly, and those in charge have now a greater responsibility in meeting the demands of the present day for quick and accurate telephone connections.

In Liverpool we have made attempts to keep abreast of the times, by endeavouring to bring the operating force up to a higher degree of efficiency, with a fair amount of success, and also by inducing the subscribers to provide those facilities for handling the traffic which are absolutely essential to an up-to-date telephone service. I am led to believe that the following points may be of more than passing interest to those who engage in that most interesting and important branch of the Company's business—operating:—

No attempt has been made to bring in questions of traffic matters, which may be considered of a highly technical nature, but only a few plain facts dealing with everyday occurrences in the average exchange, the object being to show that by perseverance in the face of difficulties and persistent elimination of trouble an improved service is assured.

Good Service.—The elements of good service have been so frequently and clearly described, from time to time, in the JOURNAL, that it is only necessary for me here to mention a few of the principal items which form the main points in the operating, and also at the subscriber's end of the line.

Operating.—Quick answers.
Smart clearing.
Correct connection with the number asked for.
Absence of cut-offs.
Absence of "no replies."
Absence of engaged numbers.

Subscriber.—Prompt answer to calls.
Proper provision of lines to carry traffic.
Installation of private branch exchange, with qualified operator where necessary.
Answering calls with name of firm, saving time and unnecessary questions.
Giving correct exchange and number when calling.

Standard of Service.—The American standard of service, so far as the answering of calls is concerned, is considered satisfactory when the following results are obtained, but in many exchanges in this country they have already been improved on:—

13 per cent. of calls answered in 2 seconds, or less.
20 " " " 3 " "
50 " " " 4 " "
75 " " " 5 " "
90 " " " 8 " "
95 " " " 10 " "
100 " " " 20 " "

To obtain the foregoing results there are many factors to be taken into consideration, of which the following are a few of the most important:—

Good organisation.
Careful distribution of operating force to meet the traffic as per quarterly load line.
Team working.
Distribution of load.
Good maintenance.

Modern Apparatus.—Whilst it is very desirable from many points of view to have the latest and most modern equipment in switchboards, this is not an absolute necessity to obtain results which will produce figures as representing the standard of service required.

There are many exchanges with old types of hand-restoring indicator boards now showing results which a few years ago were thought impossible on that system.

Possibly no better case can be quoted to support this statement than the Liverpool Central Exchange. The switchboard is of the hand-restoring indicator pattern with the highest multiple of any in the country, fitted with five-point break jacks on junction sections, and three-point break jacks on local sections. The operators on the incoming junction sections have to stand in many cases as much as 60 to 70 per cent. of the day, on account of the height of the multiple, and on the local sections they are constantly compelled to stand in making connections and disconnections for the same reason; 34 per cent. of outgoing junction traffic has been handled without the use of order wire keys, increasing the length of the operation per call. Owing to the number of outgoing junctions there is no spacing between the multiple, outgoing junctions and answering jacks, and in some cases no room is allowed for designation strips for the outgoing junctions.

The switchboards are fitted in two rooms (one with sections on both sides), each room is again subdivided by chimney breasts, hiding the face of more than one complete section from view, making it extremely difficult for supervision. The dead ends of the sections, of which there are eleven, cause a loss of operating efficiency of 2·9 operators' load per day.

These local conditions are not stated because there are possibly more obstacles existing in this exchange than elsewhere, but only with the object of showing what has been accomplished (notwithstanding the difficulties mentioned) in improving the service, and the following figures support my claim:—

Year.	Average answer.	Average clear.	Total operation.	Percentage of calls answered in seconds.					
				2	3	4	5	10	20
1902	10·6	11·2	21·8	—	—	—	36	68	—
1905	10·3	7·7	18·0	23	35	45	50	71	88
1906	8·8	9·9	18·7	22	30	39	47	74	90
1907	4·6	7·6	12·2	33	56	66	76	93	97
1908	4·0	5·5	9·5	43	67	76	83	95	99

Later returns for 1908 show further improvement, but the above figures need no comment.

It may be asked to what do we attribute this improved service. The contributing factors can briefly be stated as follows—not in their order of merit, as it would be difficult to place them in their importance:—

Institution of daily observations.
" " operating school.
Improved organisation in exchange.
Increased efficiency in operating staff.
Improved team working.
Keener supervision.
Lectures to supervisors, monitors and operators.
Encouragement.

Supervisors.—Those in charge of exchanges will agree with me when I state that the supervisors are practically the backbone of the service. The supervisor to-day has to be prepared for real hard work; the days when she could supervise her operators from a desk and chair are past, and she must constantly be on the move to give a helping hand where required. The responsibility of a supervisor cannot be over-estimated if she thoroughly appreciates her duty in the right spirit. On her alone to a very great extent depends the results obtained, in seeing the operators are carrying out their instructions, and giving them all the assistance she can by distributing the rush of calls that frequently come, and helping them to clear; at the same time she must be on the look-out for any irregularities in the operating and at once stop them, not by harsh or unkind methods, but with firmness and tact, showing the operator her faults and the remedy to be applied, remembering that the operators look to her for assistance and guidance.

Team Working.—Team working is so well known that it appears superfluous to mention it, and my excuse, if any be necessary for doing so, is that there may be some that do not fully appreciate its value, and to those I would just point out a few of its advantages.

1. It distributes the work evenly and prevents the operators being overwhelmed with extreme rushes of calls.
2. It gives a uniform rate of answering.
3. It allows the operator more time for supervising her calls.
4. It allows operators to clear more quickly.

To get the best results in team work the operators should be in one continuous line side by side. Dead ends of a section are a loss to the efficiency of the working. Lamp calling systems are much better for team working than indicator boards, as the lamp fails to glow when the operator plugs in. The difficulty the operator experiences with hand-restoring indicators is that the signal must be restored, and in doing so she is liable to impede the work of the next operator. It is most important that the indicator should be restored at the time the operator plugs in, otherwise the same call may be taken by two or more operators. Another drawback to hand-restoring indicators is the difficulty of seeing the calling subscriber's number on the back of the indicator, should it be a cross connection, and the operator's being unable to reach the answering jack.

It will no doubt interest many to know that where team work is efficiently carried out the average amount done by each operator is 45 per cent.; the maximum, 62 per cent.; and the minimum, 17 per cent. Operators have, as a general rule, unless keenly supervised, a strong tendency to show preference in answering subscribers on their own position first, irrespective of the order of calling. This is wrong in principle, as it causes long and unnecessary delays; calls should be taken as far as possible in their order of calling, and by this method you get a uniform rate of answering.

Complaints.—The most common complaints received in most exchanges are due to engaged numbers, cut-offs, and "no replies," and as special efforts have been made in this exchange to get at the real cause of each class of trouble, I will give the results of the investigations made, in the hope that they will be of interest to those who have not made any special study of these complaints.

Numbers Engaged.—Only monitors and those in charge of exchanges have any real idea of the amount of abuse levelled at the service owing to the subscriber's being told "Number engaged," and how extremely difficult it is to give a satisfactory explanation to a complaint of this nature, unless it is investigated at the time. The lost calls in this exchange due to the numbers being engaged is approximately 15 per cent. of the total traffic. This means that out of 96,000 calls per day, a load of 14,000 calls is ineffective.

I have endeavoured to find out what percentage were actually talking at the time they were asked for, and from 363 cases investigated the following results were obtained:—

Actually speaking	268	= 75	per cent.
Cleared before traced	48	= 13	"
Subscriber failed to give "clear"..	22	= 6	"
Slow clearing by operators ...	11	= 3	"
False engaged test on line ...	9	= 2	"
Not cleared at distant exchange...	5	= 1	"

It will readily be seen from these figures that the service is responsible for only a small amount of the above; on the other hand, it is for the busy subscribers to provide sufficient lines to accommodate their traffic, and I shall have something to say later regarding what we are doing to draw their attention to the number of calls we are daily dealing with owing to their lines being frequently engaged.

Cut-offs.—This trouble arises through various causes, and it is perfectly safe to say there is hardly an exchange in the country, modern or otherwise, which does not have its share. Cut-offs are accounted for by operator's and subscriber's irregularities and by faulty maintenance; the latter by faults on subscribers' apparatus and lines, junctions, relays, cords, clearing signals, etc., etc. Subscribers cause them by failing to hold the line. Operators cause them by careless testing, the alloting and taking of wrong junctions, and disconnecting the wrong connections.

It is opportune here to mention that we have about 800 calls per day interrupted by subscribers accepting trunk calls while engaged locally, and frequent complaints are received from subscribers that they were cut off. This may be due either to their not hearing the operator challenging the called subscriber to accept the call, or to their being away from their instrument at the time, and on coming back finding the line clear. It is most essential that operators should in all cases make it clearly understood to the called subscriber that he should give the "clear" before she makes the connection; if not he will be left connected on the local position and test engaged to all other calls.

The result of the special investigation produced the following figures:—

Not classified	40·5 per cent.
Subscribers	35·3 "
Operating	13·6 "
Maintenance	10·6 "

It will be noticed that subscribers' irregularities (chiefly owing to their failing to hold the line) are responsible for 35 per cent. of this trouble which single indicator clearing cannot prevent. On the common battery system with double clearing this trouble would be obviated.

"*No Reply's.*"—A special record was taken for three days, from 9 a.m. to 6 p.m., of all cases where no reply could be obtained, and the total reported was 1,860 cases, or 620 per day, representing ·6 of the total traffic; 437 were specially dealt with, and the following results obtained:—

Cause.	No.	Percentage.
Subscriber slow in answering	240	54·9
Subscriber not in at time of call... ...	102	23·3
Subscriber busy—could not answer ..	15	3·5
Subscriber answered but could not hear calling subscriber	23	5·3
Multiple not plugged up	15	3·5
Fault on subscriber's line	16	3·6
Fault on subscriber's instrument ...	14	3·2
Fault on subscriber's line in exchange ...	12	2·7

From this it will be seen that subscribers themselves are responsible for no less than 82 per cent. of this trouble, maintenance 13 per cent., and for the remaining 5 per cent. there is no evidence to prove the cause. Slow answering by subscribers unnecessarily increases the load of ineffective calls. A subscriber frequently calls the exchange after an inward call to him has been abandoned and enquires "Who's ringing me?" This question the local operator is not in a position to answer, and in reply uses the expression, "I am sorry, I don't know; there is no one on your line now."

Summarising the total of these three common complaints previously described, we get the following results:—

Subscribers	66 per cent.
Calls not traced	19 „
Maintenance	9 „
Operating	6 „

From these figures it will be noticed that the subscribers are directly responsible for the majority of their own troubles. There is still a large amount of educational work to be done in inducing them to provide sufficient lines to accommodate their traffic, thereby reducing the ineffective engaged calls, and to be prompt in answering their inward calls. It is certainly bad etiquette to keep the calling subscriber waiting, which no doubt would be strongly resented were a personal visit made.

(To be continued.)

BIRMINGHAM MIDLAND EXCHANGE.

A Brief Description of the Equipment, etc., of the National Telephone Company's New Premises in Hill Street, Birmingham.

By T. CORNFOOT AND F. G. C. BALDWIN, A.M.I.E.E., *Electrician and Engineer, Birmingham.*

THE above exchange, situated in Hill Street, near New Street Railway Station, was successfully opened on Saturday, Nov. 14, 1908, when 1,381 subscribers were transferred from the Central Exchange.

The necessity for the new exchange was proved in investigations carried out about three years ago, when the central portion of the Birmingham district, after very thorough consideration, was divided up into several defined areas, each one of which was to be served by its own exchange. One of the exchanges then decided upon was the "Midland," which is the subject of this article.

The present and estimated ultimate equipment (which is common battery) is as follows:—

	Ultimate capacity.	Present equipment.	In use at opening.
Subscribers' lines	10,000	2,740	1,381
Incoming junctions	1,000	378	185
Outgoing junctions	1,000	380	172
Private lines, extension lines, through junctions, etc. ...	2,000	620	54
Total ...	14,000		

Mr. Leonard Stokes was architect for the building, and Messrs. Wm. Sapcote & Sons, of Birmingham, were the contractors, and work was commenced towards the end of 1906. The telephone equipment was supplied and installed by the Western Electric Company.

The building is of brick—Staffordshire wire cut—faced with stone, the stone arches forming the front of the ground floor being supported on piers of grey granite unpolished. The overall height is 85 feet, and the whole structure is protected from lightning by a series of vertical galvanised iron points distributed at frequent intervals over the roof, all of which are connected together and to earth by means of galvanised iron stranded wire cables, thus forming round the building a protecting network.

A view of the front of the building as seen from the Hill Street side is given in Fig. 1, the entrance at the back being from John Bright Street.

The building is so designed that it may conveniently be extended rearwards, that is, towards John Bright Street when necessary.

The disposition of the various departments, offices, etc., is as follows:—

Basement (under part of ground floor only)—Cable subway, heating apparatus, etc.

Ground floor—Engineer's department, stores, public call offices.

First floor—District manager's offices, district office and contract department.

Second floor—Electricians' department, apparatus room.

Third floor—Operators' quarters, typists.

Fourth floor—Traffic department, switchroom, drawing office.

The manner in which the underground cables are led into the building presents some interesting features. The latest improvements in leading in have been introduced in this exchange and form an example of the Company's present standard practice.

A bank of 30-way conduits enters a subway from the streets at both front and back of the building. The subway is situated directly beneath the apparatus room which is two floors above. The ducts used for this work are two- and three-way multiple glazed vitrified earthenware of internal dimensions 3 inches by 3 inches, each being 2 feet 6 inches long. The ducts are laid in

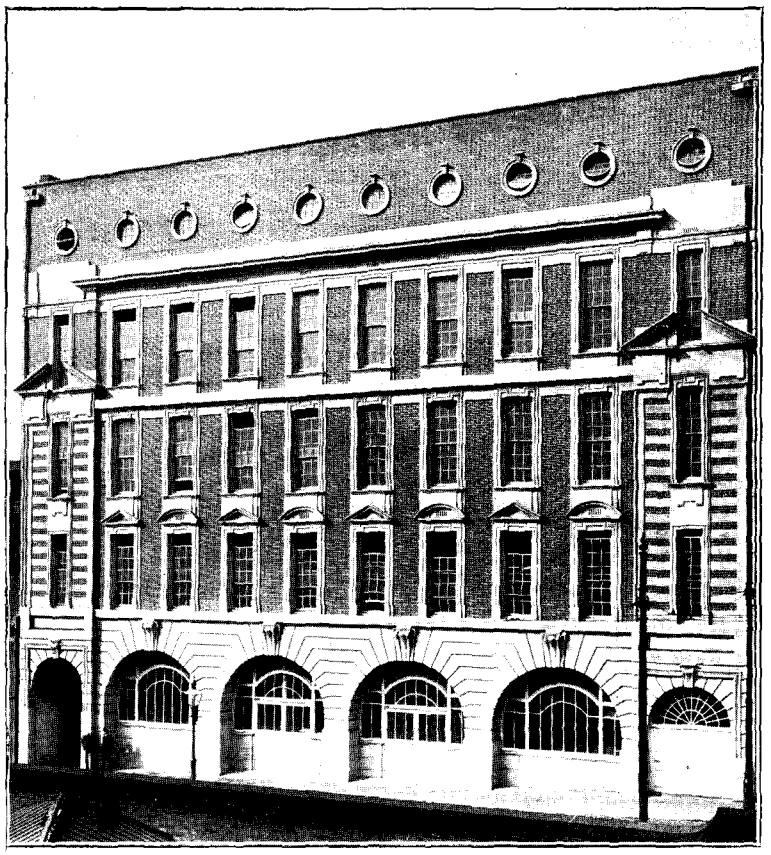


FIG. 1.—MIDLAND EXCHANGE, BIRMINGHAM. FRONT VIEW.

cement on a concrete foundation, the individual joints where adjacent ducts abut being first bound round with asphalted canvass strip put on hot. This prevents the semi-liquid cement penetrating to the inside of the duct. The joints are "staggered" to ensure stability. Over all the ducts were treated first with a layer of cement, and finally, as an extra precaution against ingress of moisture, with an external coating of asphalte. The manholes to which the conduits connect were similarly treated with asphalte, and are provided with drains to prevent accumulation of water.

The conduits are arranged in six layers of five horizontal ducts and are "stepped" as shown in Fig. 2, which is a view of one end of the cable subway. Forty-three similar ducts extend upwards from this subway to the apparatus room—being built into the walls of the two intervening floors. The vertical ducts are distributed in eight groups of five and one of three along the length of the subway in such a manner that they are available for certain of the horizontal ducts as required.

The photograph given of the interior of the subway very well illustrates the manner in which the dry-core cables enter and pass upwards to the apparatus room. The desiccating apparatus may be seen on the left-hand side and also the galvanised iron piping

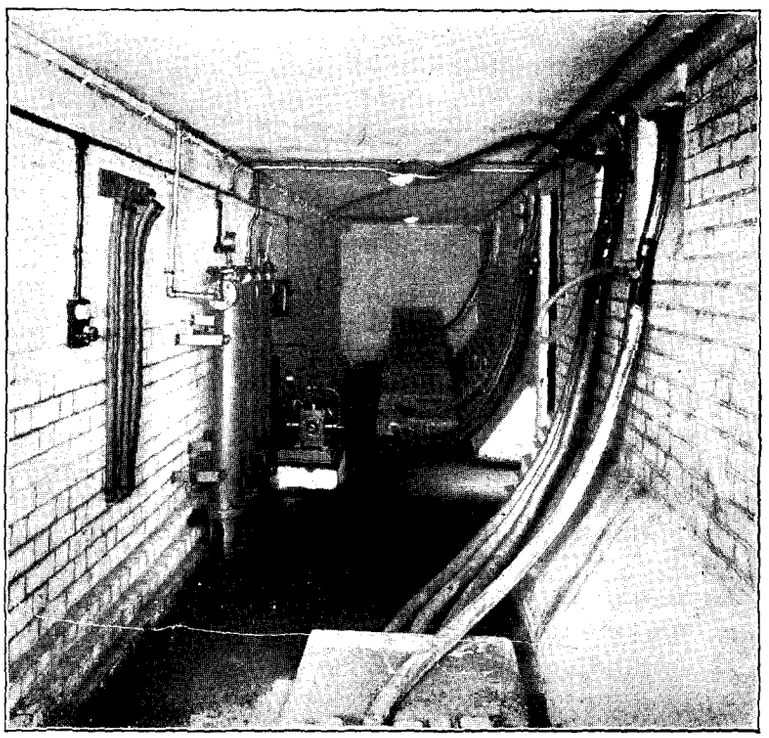


FIG. 2.—CABLE SUBWAY SHOWING CABLES AND DESICCATING APPARATUS.

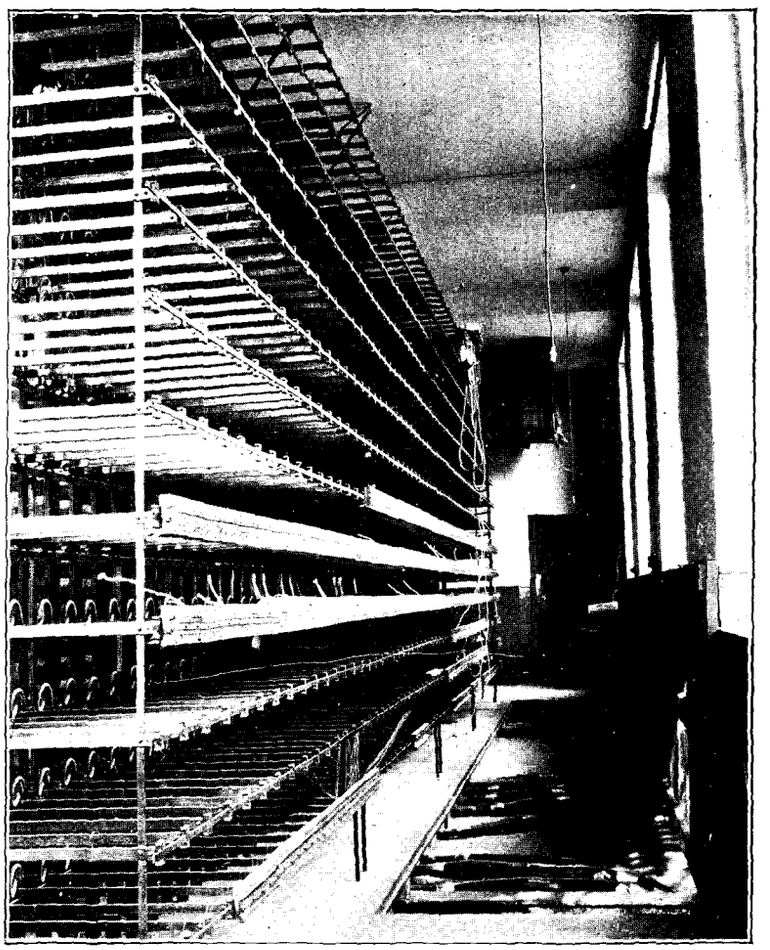


FIG. 4.—MAIN DISTRIBUTING FRAME. HORIZONTAL SIDE. SHOWING CABLE TRENCH WITH FLOOR RAISED AND "SOLID" JOINTS EXPOSED.

which connects therefrom to the cables, on the right. One cable is shown connected by a flexible rubber tube ready for pumping. The original intention was that the cables should be jointed in the subway if necessary, but it has been possible to lay all the cables without jointing as will be noticed in the photograph.

The dry-core cables enter the apparatus room through the vertical ducts already mentioned, and are there jointed to silk and

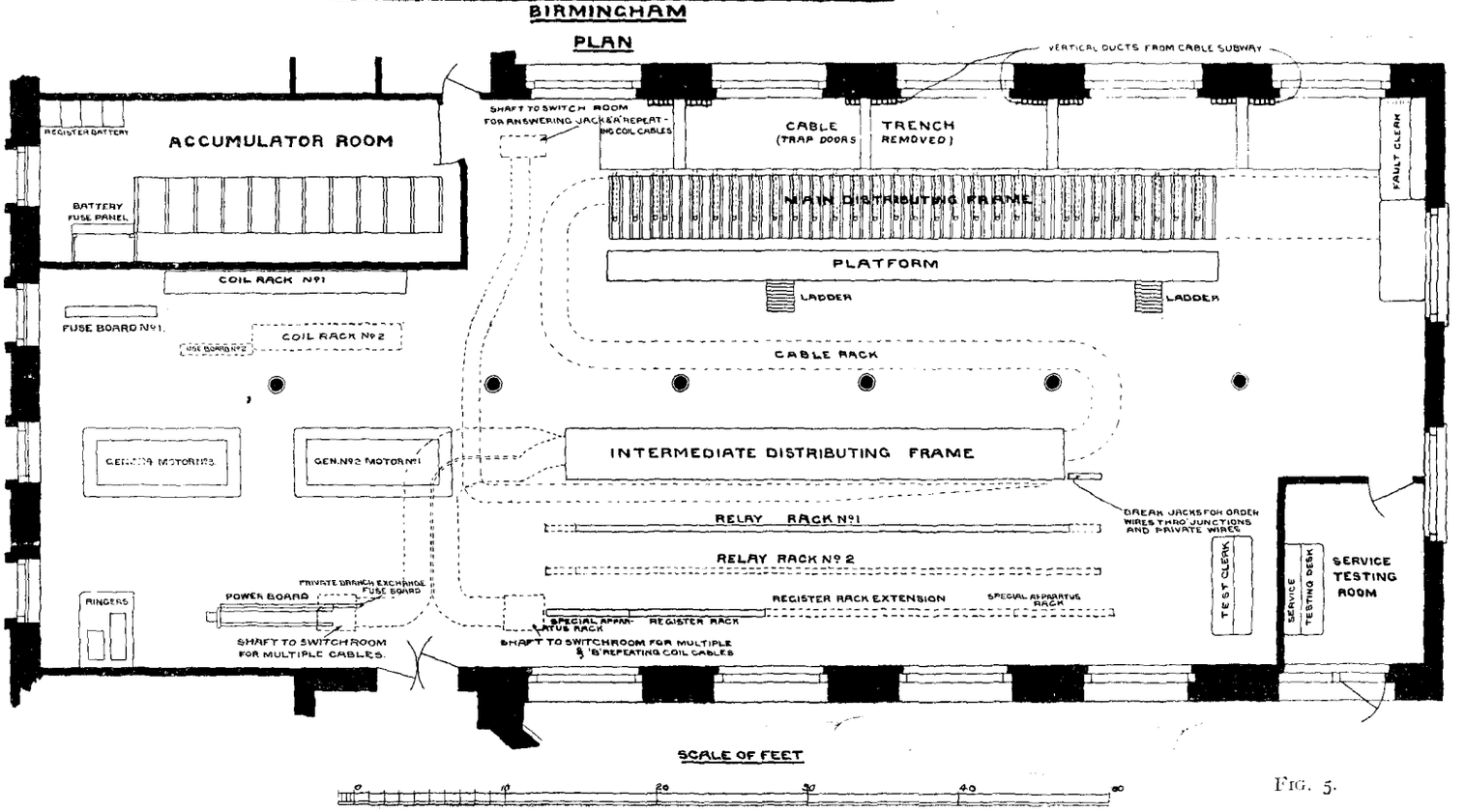


FIG. 5.

cotton lead-covered cables in a trench at the rear of the main distributing frame.

Fig. 3 is a vertical section of the main distributing frame, and illustrates the arrangement of the frame and silk and cotton lead-covered cables. Each vertical arrester strip accommodates 250 pairs. The solid joint is shown in the trench between the vertical ducts and the distributing frame. The silk and cotton cables pass from this trench through cast-iron bends buried in the concrete floor beneath the main frame, and then are taken direct to the vertical strips carrying fuses, carbon arresters and heat coils on the front of the frame. The individual wires pass first through holes in a fanning strip, and are then soldered to tabs connected direct to

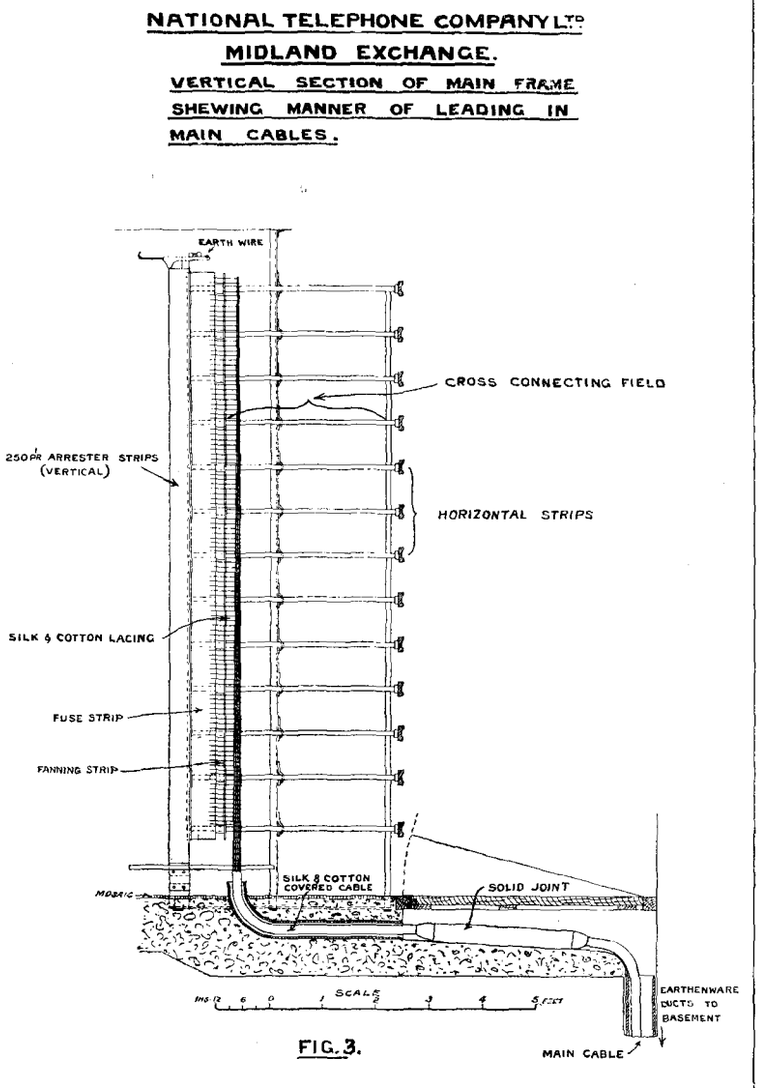


FIG. 3.

the fuses. It will be appreciated that the length of silk and cotton cable required as compared with that for serving the older type of main frame is small. Cross-connecting is carried out between the vertical arrester strips and the horizontal strips at the rear of the frame, and the tabs on these latter strips are arranged in subscribers' numerical order.

Another illustration is given in Fig. 4 of the rear portion (horizontal side) of the main frame, and shows the teak traps which cover the trench raised and the solid joints of several of the cables exposed to view.

Fig. 5 is a plan of the apparatus room. The vertical ducts on one side of the trench and the cast-iron pipe bends on the other are there shown.

(To be concluded.)

CHESTER: ANCIENT AND MODERN.

By T. A. BATES, *District Manager, Chester.*

THE Company in the course of erecting new offices for the Chester and North Wales district have, during the excavations a few months ago, made some exceedingly interesting discoveries both from an antiquarian and archæological point of view.

During the progress of the work Mr. Robert Newstead, A.L.S., formerly curator of the Chester Museum, and now professor in the Liverpool School of Tropical Medicine, whose fame as an

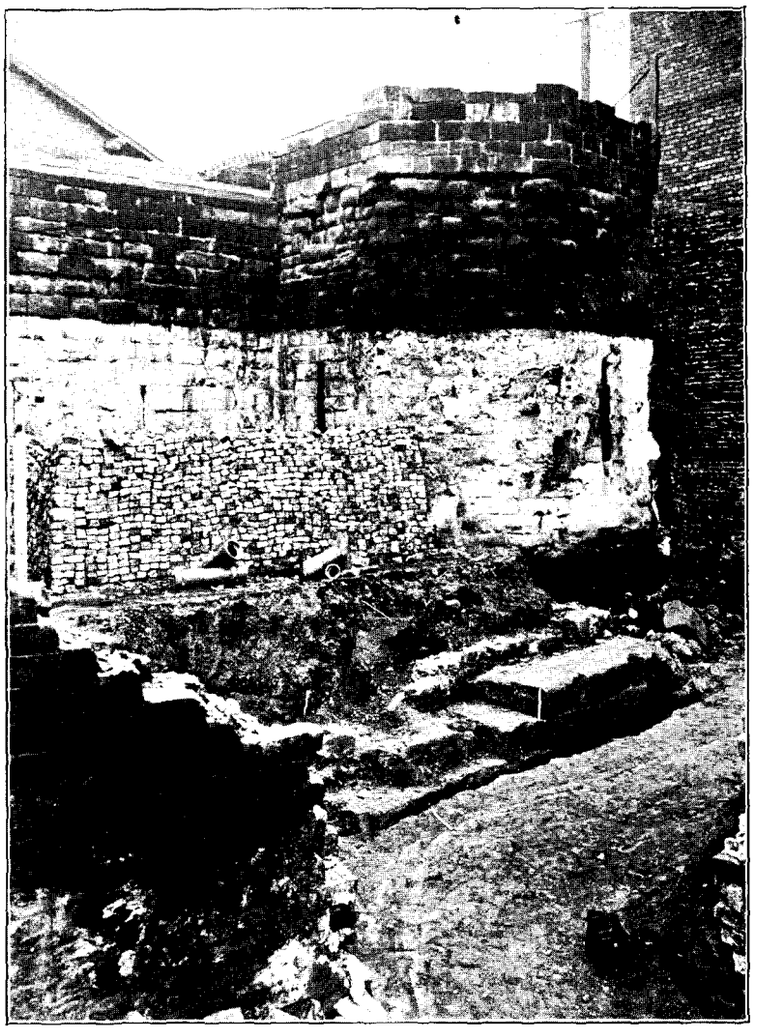


FIG. 1.—FOUNDATIONS OF ROMAN WALL, AS FIRST DISCOVERED, LYING SOUTH-EAST OF WOLF TOWER. (On the left of latter are seen the present City Walls.)

archæologist is known throughout the country, spent a considerable amount of his time in closely watching the actual digging operations.

The result has been that a section of the Roman wall which at one time encircled the city of Chester has been discovered, and is believed to be one of the finest examples of such work extant in the country. Sections of the Roman wall have been found from time to time on practically all sides of the city, but curiously enough the formation and composition of them differ. In some cases the stones are cemented with an exceedingly hard mortar well known to archæologists; and in other cases, such as the section of wall in question, the huge stones forming the ashlar work have been laid together without any mortar, the blocks themselves being so worked that even at this date it is impossible to insert the blade of a penknife between the courses. In the backing and foundation only is mortar used. It was hoped to have found on the stones of the recently discovered wall legionary

marks, but although marks have been found in other parts of the town nothing was noticed in this case.

I do not think I can do better than give the account of the discovery of this wall, and of other articles of equally venerable age, in Mr. Newstead's own words:—

"The date of this piece of the original wall of the Roman camp of Deva takes us back to about the middle of the first century, so that it is a little over 1,800 years since it was erected. Its excellent state of preservation is due to the fact that it was completely buried by the accumulation of a layer of earth and *débris* several feet thick, otherwise it would have disappeared long since by the action of frost and rain.

"In the photograph (Fig. 1) it will be seen that the foundations of the Wolf Tower rest upon the rubble work of the Roman wall, and that the latter stands some considerable distance (33 feet) from the line of the present walls, which at this point are mediæval in character.

"The greatest length of the section from north to south is 56 feet 10 inches, and the greatest height from the footings is 6 feet 6 inches. The wall takes a practically straight course until it reaches a point 22 feet south of the centre of the Wolf Tower, where it commences to curve distinctly westwards, or towards the Pepper Gate.

"The photograph (Fig. 2) will give an excellent idea of the ashlar work, behind which was a backing of rubble work, and this

FIG. 2.—ROMAN WALL SHOWING CURVE AT SOUTHERN PORTION. (Several additional feet of this have been exposed since this photograph was taken, but the footings and plinth only are preserved).

was backed again by a wall of clayey loam; the whole giving a total width from front to back of 4 feet 6 inches. The footings, or foundations (not shown in the photograph), extended about 4 feet below the lowest course of masonry, and rested upon the solid rock of red sandstone or upper bunter beds. This foundation consisted of a single layer of boulder stones and a solid mass of rubble cemented together by mortar in which sand and river gravel had been freely mixed.

"This interesting section of the Roman wall at Chester is the most perfect, and also the most extensive, that has hitherto been discovered in this city.

"It should be pointed out, however, that it differs in a somewhat marked degree from those portions of the north and west walls, which are claimed by archæologists to be of Roman origin.

"One other point should be emphasised, and that is the distinct curve the wall takes at the southern end. There can be little doubt that we have for the first time discovered the south-east corner of the Roman wall, and although we have not been able to follow the complete length of the curve, sufficient has been traced to show that the south wall of the Roman camp extended in a line drawn due west from a point at or near the Pepper Gate to Black Friars. That such a line was followed by the south wall of the Roman camp has, apparently, not been disputed; but the only evidence in support of this was the discovery in Bridge Street, west of St. Michael's Church, of an extensive concrete foundation, thought by many to indicate the position of the south gate of the camp, and the presence some few paces south of this of a deep wide drain which may have been the Roman fosse or outer line of defence to the camp."

(This discovery, I may say for the benefit of strangers to Chester, would reduce the size of the city by something like one-quarter and leave out a considerable portion of the city on the south side, although at the present moment enclosed by the present mediæval wall skirting the river Dee.)

"In addition to the wall itself we were also able to make out the nature and extent of the Roman fosse, and as the details of this portion of the fortification of Deva had not hitherto been ascertained, its discovery is rendered all the more important.

"Apart from the wall itself there were found few objects of archæological interest as representing the Roman occupation of Chester.

"A few small fragments of the characteristic red-glazed or Samian ware, bearing scenes from the amphitheatre, floral designs, figures of men, and various animals, etc., were found scattered over the excavations; and other fragments of the fictile art, consisting chiefly of Upchurch ware.

"As usual, there were numerous bits of roofing tiles and imbrices; fragments of moulded stones, secured from near the front of the wall; and several small pieces of beautiful blue glass, forming part of a large bottle-shaped cinerary urn.

"There were discovered also three Roman coins, one of which is a second brass of Vespasian, in an excellent state of preservation; two bone pins, two bronze nails, two bronze buckles, and some large pieces of waste bronze, the residue possibly from a bronze worker's office or workshop.

"The most interesting discovery of all was that of a fine stone axe of Palæolithic type, but belonging to the later stone age, or Neolithic period. It is the first of its kind found in Chester or the county, and as such is highly prized by the local authorities. It weighs 6¾ ounces, is 4 inches long by 3 inches wide at the base, and of the ordinary pyriform outline."

Although a most careful watch was kept by the Archæological Society over the excavations during the whole of the operations for any relic that might be unearthed, it is feared that the vigilance of the society, great as it was, did not prevent small articles from being carried away, as several coins and pieces of pottery ware have since been obtained by the society from other quarters which had undoubtedly come from the excavations in question.

TELEPHONE WOMEN.

XXXIII.—CONSTANCE A. FORGE.

THE popular Clerk-in-Charge of the Avenue Exchange is a Londoner by birth. After her education at private schools in Shepherd's Bush and Hackney, she entered the telephone world on Feb. 12, 1886, as an Operator at Westminster, and, like most of the telephone women on the Metropolitan traffic staff, gained her experience in many different exchanges. Miss Forge always appears to have possessed those very valuable abilities for imparting knowledge which are so essential in a clerk-in-charge. When she entered the service, and until comparatively recent years, there was no training school for operating, and newcomers had to pick up what they could of the work from watching older operators. The latter were oftentimes far from tolerant in their treatment of these learners, and they were put under the control of Miss Forge whenever she was available, with such success that there are quite a number of the older members of the operating staff who have grateful recollections of her helpful manner at this critical stage of their career.

Miss Forge was first made Clerk-in-Charge in November, 1898, at London Wall, and has since held a similar position at Holborn

and Avenue, being appointed to her present exchange in March, 1904.

Her life in the Company has been uneventful, but, she states, very happy. She is fond of her work, and ambitious to obtain the best results, and her success is, without doubt, due to a naturally kind disposition, which enables her to obtain good work by encouragement rather than coercion. Miss Forge's recreations and hobbies are varied, and range from organising "feeds" and

CONSTANCE A. FORGE.

entertainments for slum children, to the management of highly successful dances. She is also, it may be added, a strong advocate for women's suffrage.

XXXIV.—MAUDE GLADMAN.

THE subject of this sketch entered the Company's service on May 14, 1897, as sole Operator at the Kemp Town Exchange, Brighton, and although this exchange cannot boast of an extent such as that of the Central or Hove Exchanges at Brighton, the record of the Brighton telephone women could certainly not be considered complete without a notice relating to Miss Gladman.

At the time she entered the service Kemp Town Exchange was served by an old earth circuit indicator board with very large drop indicators, and this old board was fixed between two upright posts between the floor and the ceiling. About six years ago this was replaced by three standard 50-line sections, and the lines were metallic circuited, and from time to time these have been supplemented till finally the ring-off indicators had to be brought into use for calling, owing to the rapid development. Early this year the premises were enlarged, the switchroom removed to the lower floor, and convenient tea rooms and offices added, the present exchange equipment consisting of No. 9 common battery. The service given at Kemp Town Exchange compares very favourably with other exchanges. When Miss Gladman entered the service there were less than 100 stations working in connection with this exchange, while at the end of September of last year the number had increased to nearly 700, and there are now five operators, in addition to the clerk-in-charge.

Miss Gladman is very popular amongst her staff, being gifted

MAUDE GLADMAN.

with good temper and a sunny disposition; and with regard to hobbies, it can safely be said that her only hobby is "telephones." Seeing that she is so enthusiastic a telephonist, it is small wonder that she was selected in November, 1904, as Clerk-in-Charge over the exchange which she knows so well, a position which she has filled with credit to herself. Miss Gladman has served under three district managers.

HAMBURG NEW EXCHANGE.

A DESCRIPTION of the proposed reconstruction of the Hamburg telephone system was given in the November, 1906, number of the JOURNAL.

FIG. 1.

The building has now been erected and one of the long distance exchanges shown in Fig. 1 was brought into use on Sept. 1, 1908.

FIG. 2.

Fig. 2 shows three sections forming part of the equipment.

Fig. 3 shows the recording operators' positions and the sending and receiving desk of the pneumatic tube system.

FIG. 3.

It is understood that a full description of the plant will appear in the *Electrotechnische Zeitschrift* in the near future.

[We are indebted to Mr. Ernst Feyerabend, of the Imperial Postal Administration, Hamburg, for the above photographs.]

A TELEPHONE HOUR.

A SOCIETY girl whose engagements are many and who is therefore out a good deal has (says the *Dundee Courier*) estabished a telephone hour. In this way her friends are always sure of catching her on the wire, and she comes in for many unexpected good times that otherwise might be missed. Until she did this it was almost impossible to get her. Now if she is not at home at the telephone time she calls up the house and tells the maid where she may be reached. The arrangement works to a charm, she says, and nothing would induce her to go back to the haphazard fashion of any and no time.

A DESCRIPTION OF THE MANUFACTURE OF THE COMPANY'S DRY-CORE CABLES, AND THE TESTING AND INSPECTING OF THEM.

BY F. D. LATIMER, *Cable Department, Engineer-in-Chief's Office.*

MODERN cables for telephone circuits consist of three essential parts. The conductor, for which copper is exclusively employed; the dielectric, constituted of a judicious mixture of air and paper, from which any suspicion of moisture must be removed; and the sheathing, which may be of lead-tin alloy, pure lead, or vulcanised rubber. A description of the manufacturing methods involved in producing these parts, and in their assembly to form a cable, designated a dry-core air-space cable, will, it is hoped, prove interesting.

The rolling and drawing of the copper may be omitted, as it is not usually carried out by a cable maker.

The copper wire in the form of a loose coil is first placed either on a fixed cone or wound upon a bobbin, which is then taken to the paper covering machine; here the wire is made to travel quickly forward through a "die," while a roll of specially prepared paper of varying width and thickness, according to the gauge of the

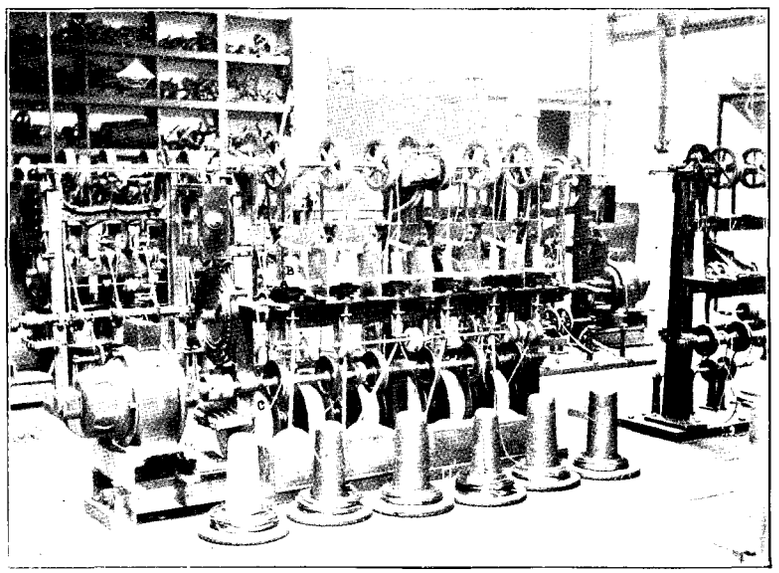


FIG. 1.

conductor, is caused to revolve at considerable speed and lap itself round the conductor (the "die" keeping the dielectric at a suitable degree of looseness), which emerges from it neatly enveloped in paper, which in turn encloses a certain amount of space occupied by air. This is known as "spiral" wrapping.

An alternative method is the "longitudinal" covering, and consists, as its name implies, in compressing the paper in a lengthwise direction on the conductor, and holding it in that position by means of a lapped thread.

Fig. 1 illustrates the process, the bare copper will be observed in the foreground. As the conductor and paper are drawn forward they first pass through a guide and then through a "die" (A) which wraps the paper round the copper and controls the diameter of the paper tube. Also can be seen the reel of thread (B). The covered wire passes over the wheels at the top of the machine, and is wound on a bobbin (C) at the base.

The machine shown is a combined type, having six individual "coverers" mounted together and driven from one motor. The speed at which wire can be thus insulated with modern apparatus is about one to one and a half miles per hour, the latter figure being attained with conductors up to 20 lbs. per mile. The frequency of the breaking of the paper also has a determining influence on the rate. Two such bobbins are next placed in the "twinning" machine, each one holding wire covered with different coloured paper for the purpose of identification.

Fig. 2 depicts a "twinning" or "pairing" machine, and is of a pattern which contains duplicate apparatus in one frame. The two bobbins of single wire can be seen, marked A and B. The

wire passes from them on each side of the bobbin carrier (C), which revolves in a horizontal direction, the rotation imparting a lay of specified direction. The correct length is obtained by regulating the speed at which the wires are pulled through. The two wires thus twisted together pass over a pulley (D) and are coiled upon a bobbin (E). In order that the wire shall not be "heaped" in one place a travelling guide (F) is used which conducts the pair up and

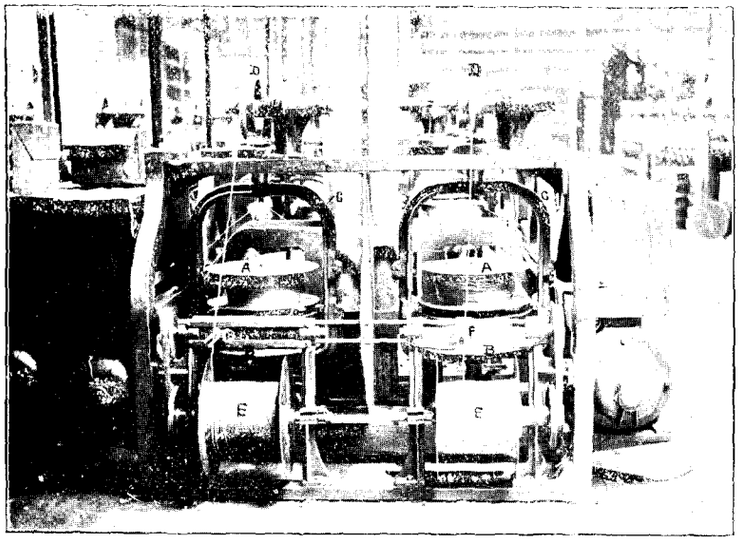


FIG. 2.

down the bobbin. A number of these bobbins (varying according to the size of cable in hand), each containing a length of paired wires, is then taken to the machine employed in the "stranding" or "laying up" of the cable, which forms the next item, and a typical machine for so doing is shown in Fig. 3.

The "strander" consists of a separate plate or carriage for each layer (A_1, A_2, A_3, etc., etc.). On each plate, or carriage, is

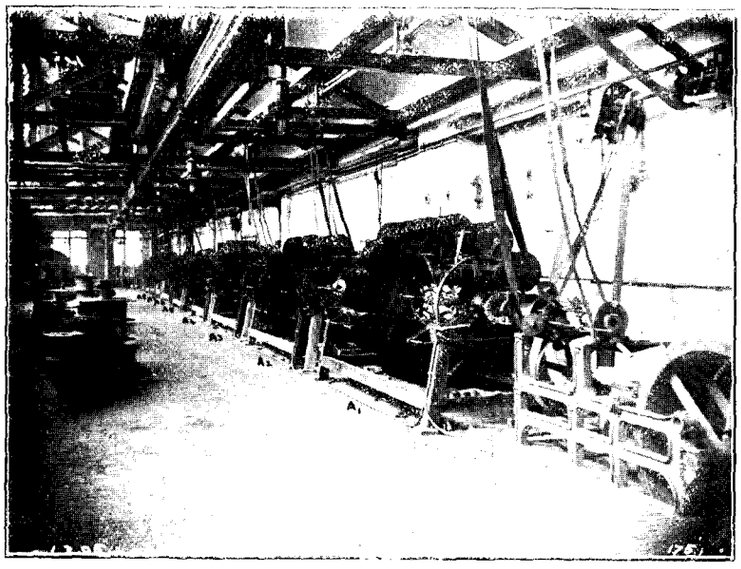


FIG. 3.

placed a sufficient number of bobbins to comply with our specified number of pairs in each layer.

Each of these plates is driven by a separate belt from the main shaft, and revolves in an opposite direction to its immediate neighbours.

Before the machine can be started, the wires from the bobbins must be threaded through small holes in a plate which is fixed close down to where the core will pass through: this has the effect of keeping each pair in its proper position.

Fig. 4 shows a smaller "strander" loaded up for building a 7-pair cable, a size used largely by the Post Office. One pair is drawn straight through to form a centre around which the remaining six pairs are encircled. In this illustration can be seen the two revolving "heads" (C, C_1) each containing a fairly wide strip of paper which serves the purpose of covering the core, and assist in holding it together.

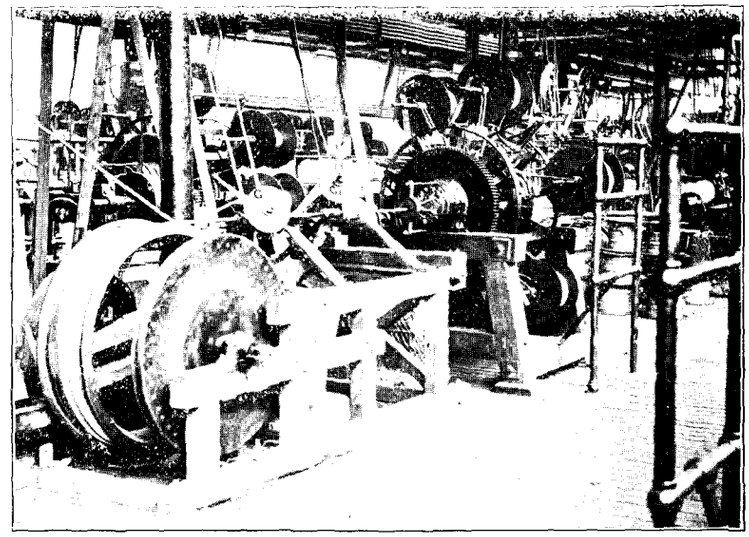


FIG. 4.

Fig. 5 represents the "winding off" gear of a "stranding" machine; here again the plate (B) which keeps each pair in the same relative position throughout the length will be observed.

It will thus be understood how by the opposite revolution of adjacent plates the cable is stranded up, layer upon layer. As the core leaves the "stranding" machine it is coiled upon a perforated iron drum the apertures facilitating the drying operation.

The drying of the cable may either be done by placing it in a

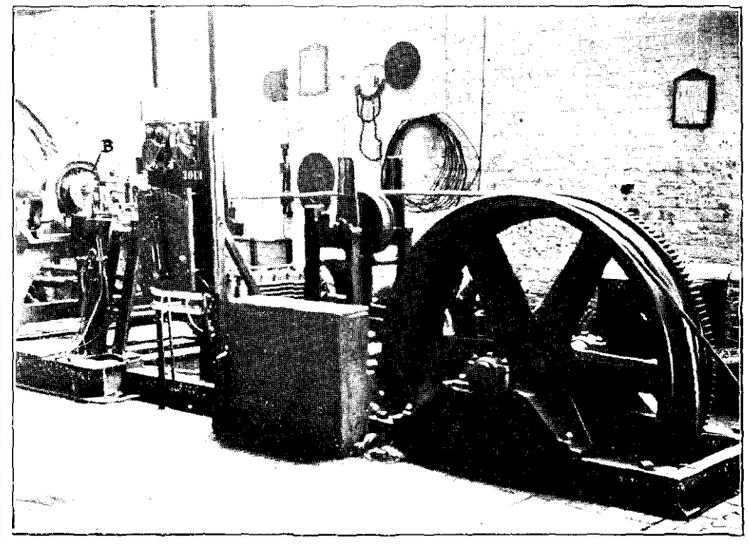


FIG. 5.

properly ventilated oven raised to a heat of 230-240° F., in which case it usually requires from one to four days to complete the process, according to the size of the cable, or it may be accomplished in a shorter space of time by means of the vacuum method. In this case the cable is not usually placed on a drum, but is coiled upon a tray, as shown in Fig. 6. The tray is pushed into a heated chamber, and with the exhaustion of air the moisture is drawn off from the paper. Under favourable conditions a cable of similar size to that

dried by the above-mentioned process and equally moist should be dried by the latter process in approximately one-quarter the time.

The core is now ready for its enclosure in a sheathing of 97 parts by weight of lead and three parts of tin; the object of the tin being to harden the pipe. The thickness of the sheath of the larger cables is $\frac{1}{8}$-inch.

The machine in which this alloy is forced round the cable is

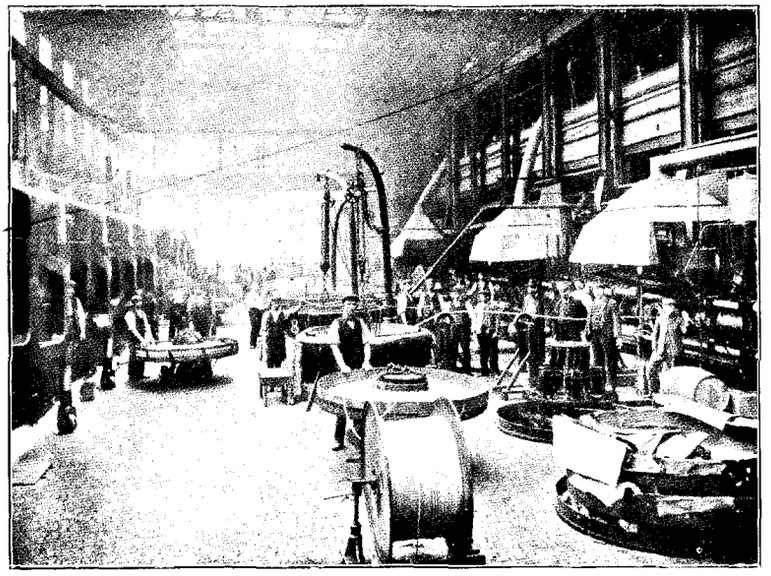


FIG. 6.

termed a "lead press" and a general view of one is obtainable from Fig. 7. On the left will be seen the lead pot under which a furnace is kept going, the pigs of lead—some of which are in evidence—are pushed into the pot and quickly assume a molten state at a temperature of about 620° F. It is then allowed to flow into and fill the "container" (A). The lead is allowed to stand in this "container" until it is in a semi-molten condition at a temperature of 600° F. At this point the machine is ready for starting; the

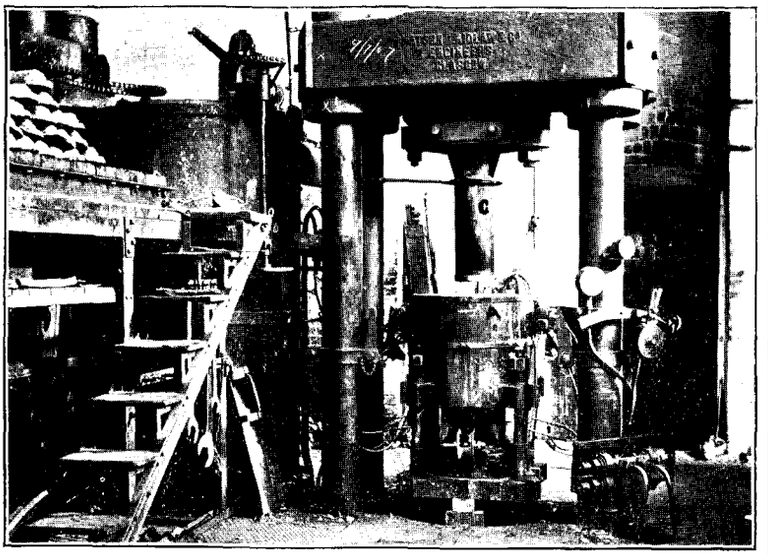


FIG. 7.

core which is pulled straight from a hot oven at the back of the press, is pushed through the circular hole between the two halves of the "die" block, which are bolted together and can be seen in the lower part of the photograph (B). Hydraulic pressure is then applied by the regulator on the right-hand side until the gauge records about $2\frac{1}{2}$ tons per square inch. The hydraulic cylinder is not visible, being below the ground level, the ram, however, is connected to the entire lower portion of the press, and gradually raises it against the fixed steel plunger (C). Under the influence of this great force the plastic lead is pressed between the point and the "die" (the proper adjustment of these parts giving the correct thickness of lead) and round the core, and the completed cable emerges from the front of the press and is immediately passed through a trough of water from whence it is wound upon a wooden

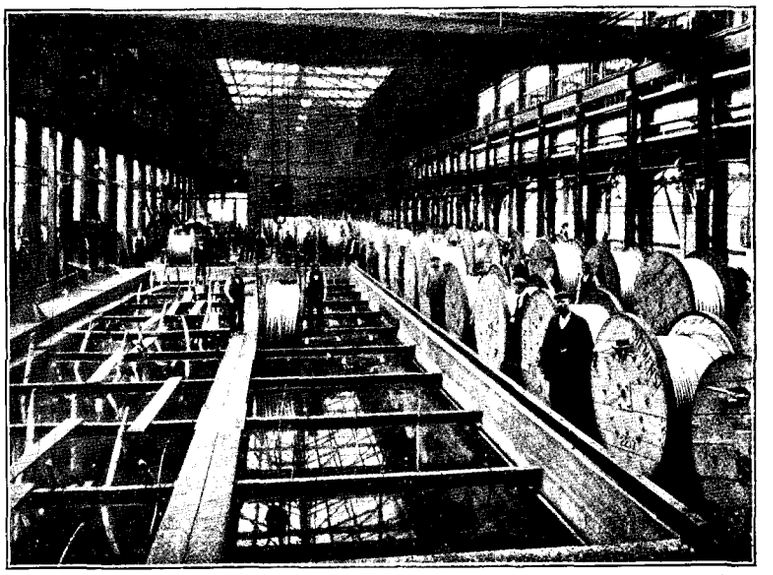


FIG. 8.

drum, which is immersed in a tank for 24 hours to permit of moisture entering should any pinholes exist. A tank used for this purpose is the subject of the photograph in Fig. 8.

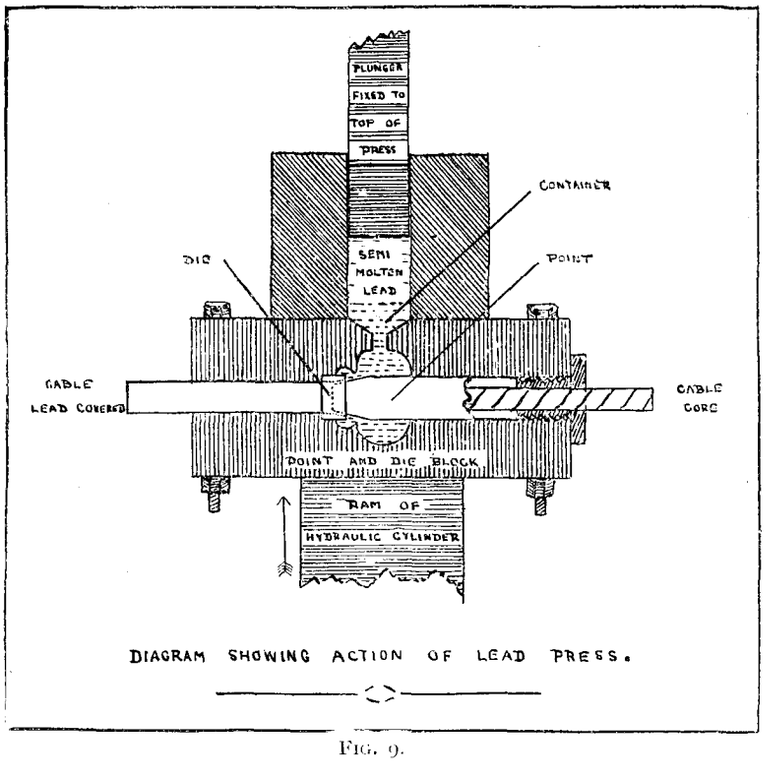


DIAGRAM SHOWING ACTION OF LEAD PRESS.

FIG. 9.

One charge of a "container" of average dimensions will lead-cover about 40 yards of $2\frac{1}{4}$-inch diameter core and $\frac{1}{8}$-inch thickness in approximately fifteen minutes, or 300 yards of $\frac{1}{2}$-inch core with 80 mils lead, in about 30 minutes.

Fig. 9 is a rough diagram which, perhaps, will more lucidly explain the action of the press.

(To be concluded.)

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VOL. III.] FEBRUARY, 1909. [No. 35.

DIVERGENCIES OF PRACTICE.

THERE are always, at least, two ways of carrying out work—the right way and a wrong way. This is generally recognised; but when it comes to determining the right way there is often a divergence of opinion.

The reason for this divergence is generally because there is no common basis of comparison. When it is the question whether one article is heavier than another everyone agrees on the standard unit of weight, and the weighing of the article determines the question; but when there are two or more courses of action to be settled the conclusion is very often arrived at without any settled basis at all.

A method which is too often neglected is to refer it to the unit of cost, and to ask "Which is the better investment?" If a little trouble is taken to arrive at the right answer the question is generally definitely settled.

We believe that one reason why some of the American telephone companies gained their lead over the rest of the world was that they were the first to recognise that it was necessary to "prove in" new methods, and that when they were "proved in," they had to be adopted just as quickly as possible.

Of late years this country has rapidly gained ground, and now a comparison between the two countries shows nothing like the difference in practice which obtained some years ago. It is true that there are still differences, but recent enquiries into these shows that these are mainly due to differences in conditions and not in methods. What is correct practice under some conditions would be bad practice in others, and it is interesting to find that when "National" basis figures are substituted for American in some cases the conclusions are altered. A good instance of this is to be found in the case of the "partial multiple." It was well known here that in America the multiple jacks were being omitted on "A" positions in cases where with the same percentage of junction working the cost of the multiple seemed to be justified here.

This has been found to be entirely due to the different basis figures of costs employed, which naturally are very different in the two countries. There is a great danger in blindly following practice just because it has proved successful under different conditions without a close enquiry into all the circumstances.

How far the course of events in this country will be effected by State ownership is a tempting subject for calculation on the basis we have suggested, but we think we are safe in venturing the opinion that if the progress made in the last few years could be maintained the telephone system of this country would be worthy of British traditions.

RECENT DEVELOPMENT.

STATISTICS can proverbially be made to prove anything—so much is there in the art of selection; but there are, nevertheless, certain statistical wells from which truth can be drawn without misgiving. Such, for instance, are plain matter-of-fact official figures, censuses, railway returns and the National Telephone Company's half-yearly return of stations. It is in connection with the latter that we would draw attention to the steady development of the telephone in the British Isles. The Company at the present time maintains 475,899 stations, and the total number worked by all administrations cannot be less than 570,000. The divergencies in the dates at which the fiscal years of the Company, the Post Office and the Corporations end render it difficult to give the total figures with a "tedious and disgusting accuracy" such as GIBBON complained of in certain Latin historians, but we know the exact number of more than four-fifths of this total, and the possession of a good basis for estimating the balance is sufficient guarantee of its practical correctness.

The fact that as recently as five years ago, at Dec. 31, 1903, the telephones in these islands did not exceed 315,000 in number proves that telephone statistics are valueless unless they are up to date; and he who draws comparisons and conclusions from the figures of two years ago is building a structure on a shifting foundation. It also proves that whereas there was in the former year one telephone to each 137 inhabitants, there is now one for every 78.

An article which we publish in another column shows that altogether 2,161 exchanges are now flourishing, of which the National Telephone Company's total of 1,546 includes a preponderating majority of the large exchanges. This figure is not of itself of great significance; an exchange may consist of two or of 20,000 lines. What is of significance is that within recent years the telephone has spread into the remotest parts of the counties, reaching small agricultural communities, rural centres, and sleepy old towns far removed from the nearest populous city. The areas abandoned by the Company under its arrangement with the Government in 1899 have since been opened up, and counties such as Lincolnshire, Norfolk, Suffolk and Buckinghamshire have been actively developed by the Post Office, while the Company within its sphere of action has developed the outlying portions of the large areas in which it worked, so that no place of any consideration is now without its exchange. Among the more important towns reached by the exchange system for the first time in 1908 may be mentioned Launceston, Blandford, Lyme Regis, Shaftesbury,

Ilminster, Alton, Crediton, Cullompton, Lutterworth, Kirkcudbright, Kildare, Monaghan, Navan and Fermoy. A list of the many places provided with a telephone exchange but not yet in possession of a railway station would make an interesting study.

As regards the development of London, over 166,000 telephones are now in operation within its area. Of these probably 150,000 are in the county of London, thus giving a telephone to every 31 inhabitants. If a more circumscribed area, corresponding to that of most foreign cities, be taken, the proportion of telephones to population is materially improved. Taking the arbitrary but extensive area of the town districts of London, say, from Islington to Newington and Camberwell, and from Paddington and Kensington across to Stepney, we find that amongst the 1,950,000 and upwards of souls within these bounds there are not less than 130,000 telephones, or one to every fifteen inhabitants, which compares not unfavourably with almost any city in the world. In Scotland with its huge tracts of sparsely populated country there are 82,000 stations or one to every 58 inhabitants. In these satisfactory developments the past year has played no small part and with so much soil yet untilled, it remains for future years to show at what rate of progress the work will be continued.

OWING to pressure on space we are compelled to hold over from this issue a large number of interesting articles.

WE regret that in Mr. W. R. BOLD'S article on "The Post Office and the Staff" the words "as to" were omitted from the last line of the second paragraph, which should read: "no recommendation as to the staff being given the full benefit of its past services."

DEATH OF MR. HAMMARSKJÖLD.

IT is with deep regret that we have to announce the death from typhoid fever after a brief illness of Mr. Peder Hammarskjöld, the Managing Director of the British L. M. Ericsson Manufacturing Company. The funeral service took place at the Swedish church in London on Jan. 22, after which the body was taken to Sweden.

Mr. Hammarskjöld, who was a Civil Engineer in Sweden and an A.M.I.E.E. in this country, came to England in 1898 as Engineer to Messrs. Ericsson's London branch. On the formation of the British L. M. Ericsson Company in 1903 he was appointed Managing Director of the new Company, retaining this post till his death.

He had been so closely in touch with a large number of the staff at Head Office for so many years that his death will be felt as a personal loss by many there, and his devotion to the interests of his own Company will make it a matter of great difficulty to fill his place.

THE NATIONAL TELEPHONE METROPOLITAN STAFF HOSPITAL COLLECTIONS—AMBULANCE CLASSES.

WE are pleased to report that the following members of the Company's staff have been successful in gaining their first aid certificates in connection with the examinations of the St. John's Ambulance Association held at the offices of the Hospital Saturday Fund on Nov. 20 and 24 last:—Head Office staff: Messrs. Frederick Dumjahn and John Sandell. Metropolitan Traffic staff: Messrs. William B. Banham (Exchange Manager, London Wall), Robert H. Teeboon (Exchange Manager, North), Eric Layton (Electrical staff), Henry V. Marks and Ernest Robbins (Electrical staff), Misses Beatrice Ashmead (Clerk-in-Charge, Battersea), Dora Hatfield (Operator, Gerrard), Eva Godden (Operator, Avenue), Rose Stone (Operator, Holborn), Edith Metcalf (Operator, Holborn), and Ella McLeod (Operator, Westminster). It is regretted that several of those who gave in their names did not continue the course of lectures, and that all those who were qualified to do so, did not present themselves for the examination, if only in recognition of the services of the Lecturer and Nursing Sisters. It is hoped that the above successful candidates will join the nursing classes, which are now in course of formation. Arrangements are being made for the supply of fully equipped ambulance boxes to those departments now qualified by having a member of the staff capable of rendering first aid.

THE VALUE OF THE "UNSUCCESSFUL" INTERVIEW CARDS.

BY G. SEYMOUR COOPER, *Contract Manager, Bristol.*

IN tackling this subject, I am strongly reminded of the old proverb, "Fools rush in where angels fear to tread," and I quote it with the hope of forestalling any person who may be disposed to add any further notes on the question.

The actual value of keeping the really unsuccessful interview card is a question that is, I think, worthy of discussion, as most contract offices have now been in existence long enough to enable opinions to be expressed which have the backing of experience.

The general principle laid down in the "Instructions for use of Card Index Records of Contract Department Work, January, 1906," is that the interview cards are firstly to be used for reporting interviews, and until the "prospect" has made his decision, they form a diary of the contract officer's future calls, after that they are filed in district and street order, so that they may be readily available for use when sending out advertising matter, and in house to house, special "trade" and "flying squad" canvassing.

A further use that is made in some contract office is that the cards are kept in street order with the new business, call office and cessation cards, so that a complete record exists of the work done in each street, with full information as to the existing and past subscribers and non-subscribers.

Mr. Dalzell said in his criticism of Mr. Maclure's paper, for the meeting at Head Office, on the alterations in canvassing methods under the measured rates, "As far as the records are concerned, the ideal we wish to attain is, that in the contract office is recorded the arguments put forward by every possible subscriber in the district as to why he is not availing himself of the service, together with the grade of service suitable to each, also a record of the arguments used by those actually using the service—but not that grade suitable to their requirements—as to why they refuse a higher grade with greater facilities." I doubt whether his ideal has yet been or ever will be attained. From twenty cards taken at random the following is the information gleaned:—Eleven "no good"; six "cannot afford"; three "subscribers—nothing further required."

The point that I am endeavouring to make in this paper is that so soon as the card bears a report that the prospect definitely declines to become a subscriber then that card should be destroyed as it is an "encumbrance," in which light the instruction tells us we must not look on them.

The first advantage claimed for these cards is that of their use in sending out advertising matter, as they constitute a record of the persons who have previously had the subject brought to their notice. I venture to state that most contract managers throughout the country would agree with me that a better method to adopt is to take the street directory and mark the streets best suited for the purpose, and then send the matter to every person in the street. This method has the advantage that the envelopes are more likely to be correctly addressed, as it is not always possible for the canvasser to obtain full initials and the proper spelling of the names. As a check against waste the telephone directory should be consulted to avoid sending circulars to subscribers—although it is a moot point whether it is not worth while to send to them also, as the telephone subscriber nowadays is so alive to rate questions that he will read all that comes in his way relating to telephone matters, and if he is not personally interested in the circular, which let us say refers to the measured rates, he may talk about in to his friends.

The street directories usually have a section in which the trades are classified, so that this can also be used when specially circularising certain trades. Further, seeing that everyone who is in the least degree likely to require the service is canvassed at some time or another the directory really supplies all the information required, and moreover it is frequently more accurate and up to date.

Taking next their use in house-to-house canvassing, I venture to suggest that they have little or no value. The practice when commencing a contract office is that the district is divided into areas, and the contract officers receive instructions to canvass

every house in every street, and every room in each house in the business centres in such areas. Periodically the canvassers change areas and the "suspense" or "diaried" cards are handed over with the areas. These, of course, are not sufficient to keep the man and the office supplied with new orders for long, which means that each man must build up a list of "prospects." How is this to be done? Why, only by a systematic house-to-house canvass again. In effect, house-to-house canvassing is always going on, with, of course, the following up of a suspense or diaried prospects. In every district the ground is continually being re-canvassed, and to give the previously unsuccessful cards to a canvasser would only tend to discourage him. A case in point occurred only to-day; a man who has been canvassed for nearly three years by every contract officer in turn has at last succumbed. Each canvasser by the way started a new card for this man. The only saving is that fewer cards would be used, but even then it is questionable whether an equal loss is not incurred in getting the cards out.

With regard to the special trade and flying squad canvassing—do either of these really pay? I am inclined to doubt it. Seeing that every and all trades and professions must be systematically canvassed in the ordinary course of business, has it yet been found that the tradesman is going to give his order at a certain time because the contract manager is making a special raid on his particular trade? The same question might be asked in the case of the flying squad "canvassee," although, in districts where plant difficulties exist largely, this class of canvass may be a necessity, as it may be in competitive areas. On this latter point, however, I have no experience.

A further help to the contract manager, it is stated, is that he will be able to judge the prospects of future business by periodically scanning these cards. This may be the case with the diaried cards, but I doubt if the judgment of the others is really worth anything. It is too much like counting chickens before they are hatched.

There still remains to be considered whether the keeping of these cards with the new business, call office, and cessation cards in street order is of any assistance to the contract office. I again venture to state that the record thus obtained is of no practical value. After all, the record of what has been achieved will not assist us in getting new subscribers, or even in getting new orders for additional apparatus. All those who have been canvassed and refused must be canvassed again and again, and a good canvasser will not fail to call on subscribers as well as non-subscribers.

The keeping of these cards in the manner laid down in the instructions costs annually a considerable amount in clerical labour, which sum, if it is agreed that the records are valueless, is a dead loss. All the staff in the contract office, both clerical and canvassing, should only be employed in working hard to obtain and retain business, and any time spent in creating useless records is defeating the objects of the office, and should be eliminated as quickly as possible.

THE GEOGRAPHICAL DEVELOPMENT OF THE TELEPHONE AS AT THE END OF 1908.

By W. H. GUNSTON.

IN a former paper I endeavoured to sketch the gradual spread of the telephone over the English counties. Established in the beginning only in those towns and districts where the population was densest, exchanges were gradually opened in the suburbs of such towns, and in the villages a few miles distant with which they were in business communication. Thus the telephone system spread in circles round the large towns, until the circles overlapped and the whole county was, in most cases, embraced by its operations. In some of the larger counties, however, the principal towns were either too small or too far apart for the intervening area to be covered in this manner. Hence, by a natural process, a village near Nottingham would be served long before a historic city isolated from any large centre of population, such as Salisbury. The rapid and wide-spread development of the telephone during the last ten years, however, reached in due course the remotest places, and by the end of 1907 nearly every county town of any importance was in enjoyment of the service. This development has been continued during the past year, and in counties with large rural areas such as Somerset, Dorset, Devon, Hampshire, Essex and Gloucester there have been notable accessions to the number of exchanges.

Taking the South Midland counties first, exchanges have been opened in *Middlesex* by the Company at Palmers Green and at Finchley by the Post Office; in *Hertfordshire* at Wheathampstead by the Company and at Dane End (Ware) by the Post Office; in *Buckinghamshire* at Farnham Royal by the Company, and at Gerrards Cross and North Marston by the Post Office; in *Northamptonshire* at Burton Latimer by the Company and at Syresham by the Post Office; and in *Bedfordshire* at Shefford and Clifton by the Post Office.

In the Eastern counties, the Company has opened at Chigwell, Epping, Rayleigh, Billericay and Brightlingsea in *Essex*, and the Post Office at Tollesbury, Tolleshunt D'Arcy, Coggeshall, Kelvedon, Castle Hedingham, Goldhanger, Danbury and Great Baddow, thirteen new exchanges in all having been established in this county. In *Norfolk* the Company has opened at Caister and the Post Office at Quidenham; and in *Suffolk* the latter have opened at Framlingham, Glemsford and Long Melford.

Turning to the South East, Speldhurst and Southfleet Exchanges (Company) and Ash, Benenden and Sissinghurst (Post Office) have been opened in *Kent*. In *Surrey* the Company has extended the telephone to Holmwood, Bramley, Purley and Betchworth; in *Sussex* to Selsey and Hurstmonceux, while the Post Office have opened at Handcross, Forest Row and Coleman's Hatch in the latter county. *Hampshire* has received a large accession of exchanges, viz., Highcliffe-on-Sea, Rownhams, Southbourne, Alton and Alresford (Company) and Petersfield and Milford-on-Sea (Post Office). In *Berkshire* the National Telephone Company has opened at Burghfield and Crowthorne.

In the South West thirteen new exchanges have been opened in *Somerset* alone, viz., by the Company at Yatton, Nailsea, Flax Bourton, Limpley Stoke, Pill, Wrington, Banwell, and Winscombe, and by the Post Office at Dulverton, Washford, Oakhill, Ilminster and Stratton-on-Fosse. In *Dorset*, Longham, Ferndown and Liliput have been opened by the Company in the neighbourhood of Bournemouth, besides the exchanges at Blandford, Shaftesbury and Lyme Regis by the Post Office. In *Devon* the Company has opened at Crediton, Cullompton, Braunton, Bovey Tracey, Yealmpton, Chudleigh and Buckfastleigh, and in *Cornwall* at Launcester, Padstow, Porthleven and St. Just.

Twenty-four new exchanges have been opened in the West Midland group of counties, of which Frenchay, Winterborne, Staple Hill and Avonmouth in *Gloucester*, Coleshill, Midland (Birmingham) in *Warwickshire*, and Barton-under-Needwood, Hagley, Biddulph, Penkridge, Silverdale, Barlaston and Eccleshall in *Staffordshire* were established by the Company. In *Worcester*, Kington was opened by the State and Upton-on-Severn by the Company; in *Shropshire* the National opened Great Hanwood and the Post Office Broomfield, Onibury, Prees and Craven Arms. The latter also established exchanges at Ynysddu and March in *Monmouthshire*, and at Wormbridge in *Herefordshire*.

In the North Midlands the Company opened at Lutterworth and the Post Office at Castle Donington, Thurnby and Wymondham in *Leicester*. Manton and Ketton in *Rutland* fall to the part of the Post Office. Alvaston and Staveley (*Derbyshire*), Bingham (*Nottinghamshire*), and Immingham and Waltham near Grimsby (*Lincolnshire*) were all opened by the Company, Greatford in the latter county being opened by the Post Office.

In the Northern and North-Western counties the principal developments in *Lancashire* (Hornby, Helsby and Haigh Exchanges) and *Yorkshire* (Earby, Gisburn, Royston and Dringhouses) are due to the Company. The Post Office, however, have been active in *Northumberland*, where they have opened new exchanges at Seaton Delaval, Haydon Bridge, Dudley, Kenton, Riding Mill and Allendale; in *Durham* at Rushyford and Washington; in *Cheshire* at Holmes Chapel and Weaverham, and in *Cumberland* at Longtown and Millom. They also extended the service to Masham and East Harsley in Yorkshire.

In Wales the telephone was at first only known in Glamorgan, subsequently being established at Wrexham and spreading along the north coast. It has now reached Pembroke and Anglesey and penetrated to the heart of Radnor and Montgomery. Exchanges were opened in *Glamorgan* during 1908 at Creigiau and Glyn Neath by the Company, and at Coychurch and Upper Cymtwrch by the Post Office; at Hawarden (*Flint*) and Deganwy (*Denbigh*) by the Company; and at Saundersfoot (*Pembroke*) and Builth Road on the borders of Brecon and Radnor by the Post Office. There are now 209 exchanges open in Wales, 106 being National, 103 Post Office.

In *Scotland* the telephone system was well developed as early as 1888, when it already reached from the Border and Dumfries to Inverness and Aberdeen. It has now extended as far as Wick and Stornoway, Oban and Fort William, but the Orkneys, Sutherland and Wigtownshire are still without exchange service. The huge counties of Inverness, Ross, Argyll, Aberdeen and Perth, with their sparsely populated expanses of mountain and moorland, possessed exchanges only in one or two of their chief towns, but in the two latter counties, as in the Lowland shires and Forfar, the same process has been going on as in England, and the telephone system within the last few years has reached all important places.

Apart from the populous counties around Edinburgh and Glasgow, those with the largest number of exchanges are Fifeshire with 36, Aberdeen 32, Perth 25, Ayrshire 21, Forfar 15, Dumfries 12 and Roxburgh 10.

During 1908 exchanges were opened in *Perthshire* at Comrie by the Company, Alyth, Meigle, Glenfarg, Spitalfield and Murthly by the Post Office; in *Fifeshire* at Thornton by the Company, and at Crail and Leuchars by the Post Office; in *Forfar* at Fettercairn by the Company and Newtyle by the Post Office; in *Ayrshire* at Darvel, in *Midlothian* at West Calder and Stow, in *Renfrew* at Elderslie, in *Haddington* at East Linton, in *Ross* at Strathpeffer, and in *Dumfries* at Lochmaben, all by the Company; and in *Aberdeenshire* at Ellon and Insch, in *Linlithgow* at Dechmont, and in *Lanark* at Symington, by the Post Office. Altogether there are now 333 exchanges in Scotland, of which 254 belong to the Company and 79 to the Post Office.

When the Telephone Company of Ireland was acquired by the National in 1893, the telephone system existed only in the neighbourhood of Dublin, Belfast and Cork, and at Limerick, Dundalk, Drogheda and Derry. It gradually spread into Waterford, Wexford, Kilkenny, Galway, Tipperary, Clare, Armagh and Sligo, until in 1900 there were 56 exchanges in Ireland. The present total has

reached 118, and when the new exchanges in Kings County are open the only county without a telephone exchange will be Mayo. During 1908 exchanges were opened in *co. Dublin* at Lucan, Malahide, Rathmines and Rathfarnham by the Company; in *Cork* at Cloyne, Glanmire and Ballincollig by the Company, and at Fermoy and Charleville by the Post Office; in *Antrim* at Malone and Fortwilliam by the Company, and at Ballycastle and Cullybacky by the Post Office; in *Down* at Knock and Warrenpoint by the Company, and at Lenaderg by the Post Office; in *Clare* at Ennis and Killaloe, in *Tipperary* at Carrick-on-Suir, in *Kildare* at Kildare and Leixlip, in *Galway* at Salthill, all by the Company; in *Limerick* at Adare by the Company, and Kilmallock by the Post Office; and in *Fermanagh* at Lisbellaw, in *Queens County* at Maryborough, in *Monaghan* at Monaghan, in *Tyrone* at Coagh, and in *Meath* at Navan, all by the Post Office.

The following table shows the geographical positions and total number of exchanges open at the end of 1908. As before, those exchanges of the Post Office to which a few subscribers are connected for trunk service only are not included. In comparing the Post Office figures with those of the Company it must be borne in mind that a great number of the exchanges of the former consist of a call office and two subscribers only:—

County.	Company.	Post Office.	Corporation.	Total.
Yorkshire	124	11	6	141
Lancashire ..	119	—	—	119
Kent	75	17	—	92
Durham	33	40	—	73
Hampshire ..	57	6	8	71
Sussex	40	22	—	62
Surrey	34	18	—	52
Gloucester ..	42	8	—	50
Northumberland ..	15	35	—	50
Cheshire	41	8	—	49
Essex	30	19	—	49
Middlesex	29	19	—	48
Monmouth ..	18	25	—	43
Somerset	30	14	—	44
Stafford	39	2	—	41
Devonshire ..	37	1	—	38
Hertfordshire ..	22	16	—	38
Derbyshire ..	26	4	—	30
Worcestershire ..	26	3	—	29
Lincolnshire ..	11	16	—	27
Warwickshire ..	24	2	—	26
Bucks	9	17	—	26
Suffolk	12	13	—	25
Norfolk	13	11	—	24
Cornwall	22	2	—	24
Leicestershire ..	17	7	—	24
Wiltshire	22	1	—	23
Northamptonshire	12	9	—	21
Shropshire ..	9	11	—	20
Dorsetshire ..	16	3	—	19
Berkshire	17	2	—	19
Nottinghamshire ..	16	1	—	17
Cumberland ..	11	4	—	15
Cambridgeshire ..	8	3	—	11
Bedfordshire ..	4	7	—	11
Oxfordshire ..	6	2	—	8
Herefordshire ..	4	4	—	8
Rutland	—	6	—	6
Westmoreland ..	5	—	—	5
Huntingdonshire ..	3	1	—	4
ENGLAND ..	1,079	389	14	1,482
WALES	106	103	—	209
SCOTLAND ..	254	79	—	333
IRELAND ..	85	33	—	108
CHANNEL ISLES	15	—	7	22
ISLE OF MAN ..	7	—	—	7
Totals ..	1,546	604	21	2,161

FROST AT SCARBOROUGH.

BY W. CASTLETON, *Local Manager.*

OWING to the dense sea mists and severe frosts, no less than 149 spans of wire have been broken down on the Scarborough-Filey junction route during the three days ending Dec. 6.

Most of the trouble occurred in the vicinity of Cayton Bay, the route at this point being exposed to the biting winds from the North Sea. The wires (100-lb. copper) were so thickly coated with

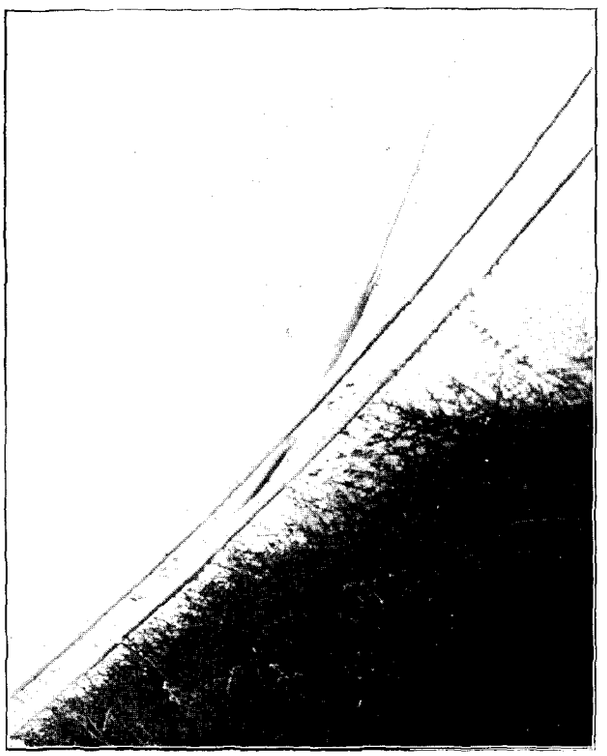


FIG. 1.

ice in places that they looked like lead-covered cables. The largest measured 7¾ inches in circumference. Fig. 1 shows wires hanging from pole to pole down a bank below the road level. Fig. 2 shows

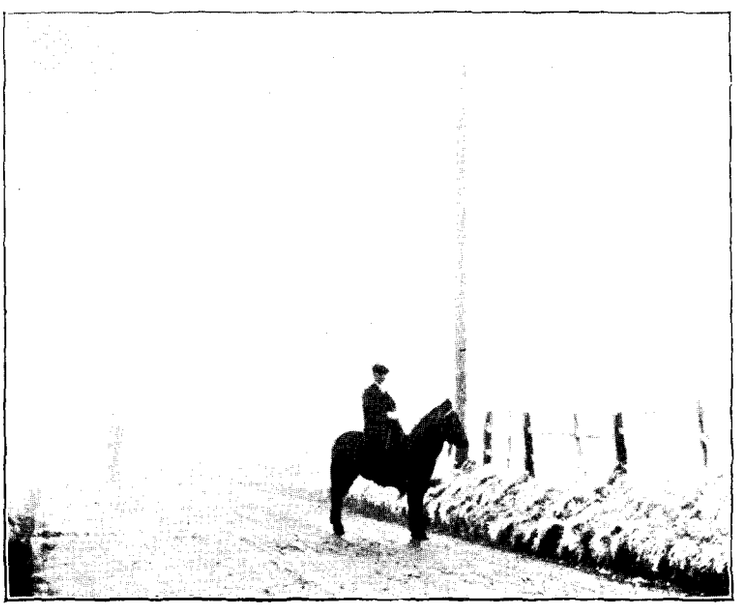


FIG. 2

the wires so weighed down as to hang to within a few feet of the road.

A remarkable feature of the case is that we have not as yet had one flake of snow in the district.

COMMUNICATION.

(From a Correspondent—Reproduction Prohibited.)

(Continued from p. 220.)

Oct. 1, 1792, is apparently the first notice of the commencement of "Money Letter" business. It runs as follows:—

"The clerks of the roads having, by permission of His Majesty's Postmaster-General, established an office for the transmission of any sum of money, not exceeding 5 guineas, by the post from London to any part of England, also to Edinburgh and Dublin, and *vice versa*, and to and from all places within England, of those persons who may choose to avail themselves of this mode of conveyance, instead of transmitting money in letters by post, that it is proposed for the clerks of the respective roads to receive any sum of money, not exceeding 5 guineas, and to give an order on the deputy postmaster of the town to which the money is intended to be remitted for the amount, which the deputy postmaster will immediately pay.

"Where any sum of money is desired to be remitted to London, the deputy postmaster of the town is to receive the same, and give an order at sight on the clerk of the road; and

"Where any sum of money is intended to be remitted from one part of the kingdom to another, the deputy postmaster is to receive the same, and give an order, payable at sight, on the deputy of that town where the same is to be paid.

"We send herewith a printed form of the order and letter of advice, which will only require to be filled up with the name of the person who pays the money, the name of the person for whose use it is intended, the sum and date, and to be signed by yourself. The order must be wrote on such a stamp as is by law required on bills of exchange and notes of the same amount, for which the party must pay you.

"When you give an order on any deputy you will not only advise him of the same, but likewise the clerk of your road, with whom you are always to account, and not with each other.

"I am also to acquaint you that a balance of the money letter account between yourself and the clerk of your road is to be struck quarterly, or oftener if necessary. If it is in your favour, it will be remitted to you by the clerk of the road, or paid you as you may direct; if it is against you, you will of course remit the same.

"This being a private account between you and the clerk of your road, it must not be incorporated with any other.

"As a recompense for the trouble which you will have, you are to receive of the party sending any remittance threepence in the £, besides the stamp duty, and of the party to whom you pay any money the like sum in the £; and the clerk of the road will, in like manner for his trouble, receive the same poundage, for which he will guarantee the safe conveyance of the money.

"As the great object of this plan is to prevent the embezzlement of letter, containing money sent by post, the Postmaster-General wishes to recommend it to your attention, and hopes you will give every assistance in your power.—I am, Sir, your very obedient, humble servant, *For* CHAS EVANS,

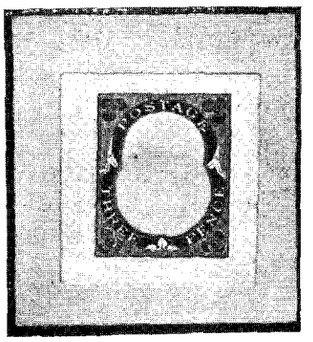
"THOS. SALTER.

"You are particularly requested to be careful of the printed orders and letters of advice, as their falling into improper hands may be attended with serious consequences."

I illustrate one of the old type of money orders.

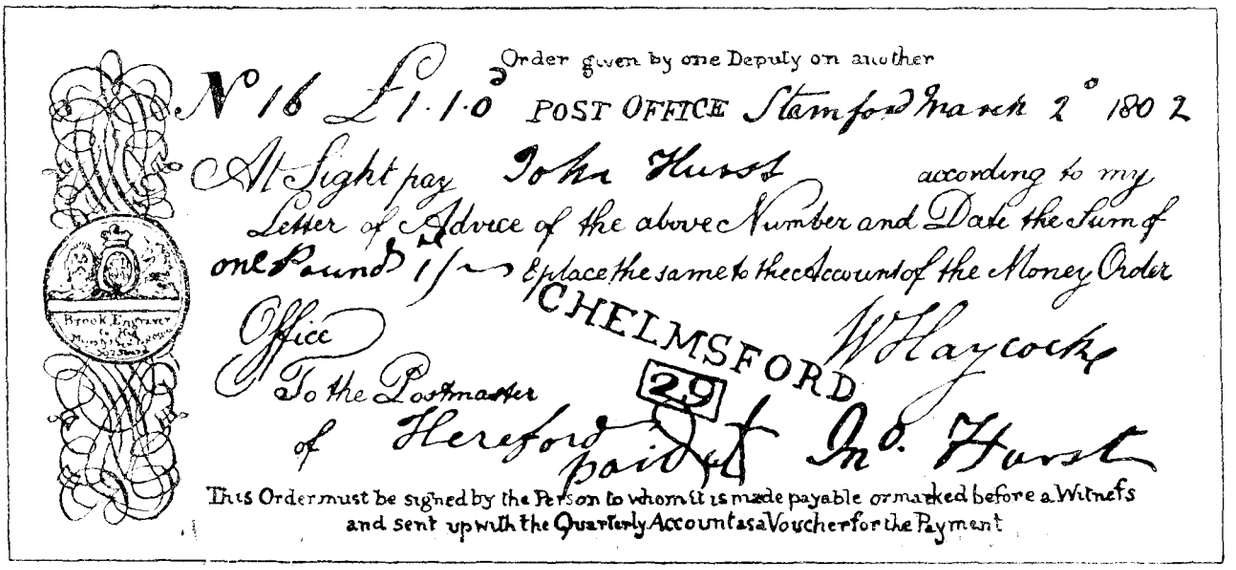
A great amount of interest attaches to the methods by which stamps were designed: for instance, for the 3*d*., rose, a Matrimonial Cause Fee 5*s*. stamp was taken, paper vignettes were cut to show only the head, and on the vignetting paper a frame for the head was designed, and so an entire stamp produced (see illustrations).

Afterwards it was thought better to reverse the frame, and so the well-known design of the 3*d*., rose, was created.



The following represents Messrs. Bradbury Wilkinson's design for a 3*d*. stamp, which, however, was not adopted:—

A suggestion to prevent the fraudulent use of stamps was an obliterating stamp with four points which perforated the label thus—


Order given by one Deputy on another
No 16 £1.1.0 POST OFFICE Stamford March 2° 1802
At Sight pay John Hurst according to my
Letter of Advice of the above Number and Date the Sum of
one Pound 1/— & place the same to the Account of the Money Order
Office W Haycock
CHELMSFORD
29
To the Postmaster
of Hereford paid
Jno. Hurst
This Order must be signed by the Person to whom it is made payable or marked before a Witness
and sent up with the Quarterly Account as a Voucher for the Payment

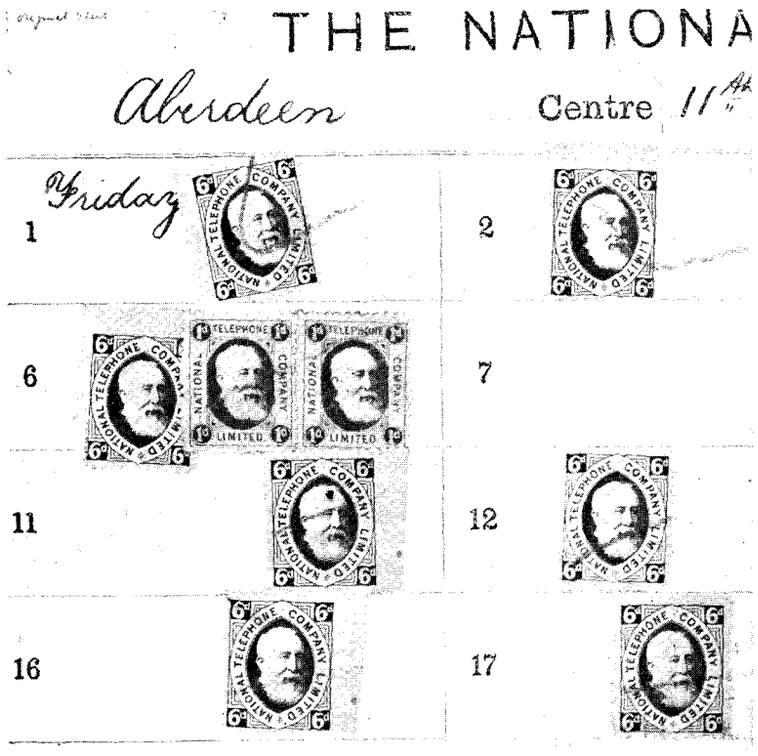
It may not be generally known amongst the more recent members of the staff, that the National Telephone Company issued stamps in December, 1884, when it controlled telephones in some portions of the Midlands and northern parts of England. They remained in circulation until the end of 1891, when they were discontinued by request of the Postmaster-General. Whilst in circulation they were sold by the Company to their subscribers and the public for the purpose of affixing to forms kept at the Company's various call offices, to pay for calls over the Company's telephone lines. The values corresponded with certain fixed rates based upon the distance intervening.

The stamps were supplied by Messrs. Maclure, Macdonald & Co., of Glasgow, and they were surface-printed, in sheets of twelve, in four horizontal rows of three, perforated twelve.

The stamps are upright rectangular in shape, and measure 18 × 22 mm. The colours are—

1*d.*, black.
3*d.*, pale red.
4*d.*, ultramarine.
6*d.*, bronze-green.
1*s.*, brown.

A very small quantity indeed, as far as can be ascertained only about 1,000, were issued.



I illustrate a portion of a sheet with the stamps used and cancelled, and cannot I think find a more fitting conclusion for this article.

THE END.

REVIEW.

The Practical Electrician's Pocket Book and Diary for 1909 (S. Rentell & Co., 355 pp., price 1*s.* 1*d.*).—This is a handy form of pocket book, intended for the use of men practically engaged in one of the branches of electrical industries. Whilst the information given in regard to telephone matters is meagre and of use only to those engaged in private telephone work, there is much useful information given in regard to the practical details of such subjects as electric light fitting, wiring, and estimating, storage batteries, electric clocks, electric fans, dynamos, electric heating, lightning conductors, testing of earths, testing by megger and other testing sets, motors, gas and steam engines, turbine engines, etc. A very useful table is given of particulars of the electric supply of the companies and corporations of the kingdom, and a special and useful feature is the provision of a number of tear-out printed slips for estimating and entering up materials, etc., for electric light and other fittings.

CORRESPONDENCE.

TRAFFIC REDISTRIBUTION.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

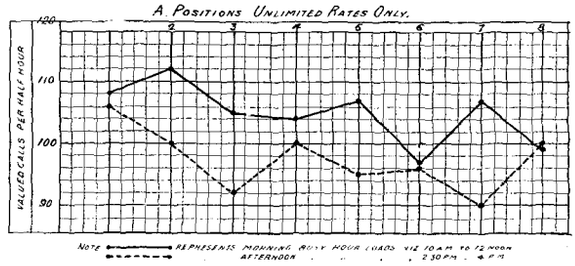
REPLYING to Mr. Rodger's further letter in the December issue, there are a few points which require taking up.

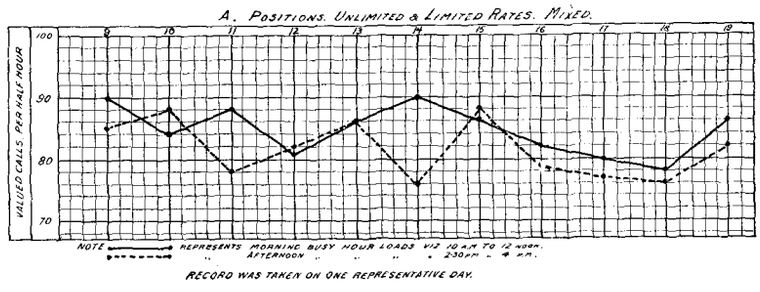
He asks in the second paragraph if it would not have been better to have procured figures first and confirmed them by "opinion" afterwards. My reply is "No." I did, and still do, say that figures are necessary and helpful as far as they go, but Mr. Rodger did not quote the whole of my statement, viz., "to be a real help they (figures) must be representative and accurate." This slightly qualifies it, and I have yet to discover such a combination.

I quite fail to see the reason for Mr. Rodger's conclusion that because there was difference of opinion the recording of calls was an absolute necessity. Does not this prove (*a*) no collusion, (*b*) an honest expression of traffic experience? My original article made it quite clear why some lines were not mentioned at all. This was part and parcel of the scheme.

Mr. Rodger again suggests a "representative" week, but does not tell us how to select this mythical time.

My October article gave a curve on the operating loads with "team work." This might, as suggested by Mr. Rodger, cover some discrepancies, but to show that such was not the case, and to subject the scheme to every possible test, we have had taken a record of calls originating on all positions (*i.e.*, panel loads). Below is given the result showing how the panels were loaded during the peaks of the a.m. and p.m. loads. This speaks for itself, and is even more convincing than the curves submitted in the October JOURNAL.


A. POSITIONS. UNLIMITED RATES ONLY.
VALUED CALLS PER HALF HOUR
100
110
100
90
NOTE REPRESENTS MORNING BUSY HOUR LOADS VIZ 10 A.M. TO 12 NOON
AFTERNOON " " " 2.30 P.M. " 4 P.M.


A. POSITIONS. UNLIMITED & LIMITED RATES. MIXED.
VALUED CALLS PER HALF HOUR
100
90
80
70
NOTE REPRESENTS MORNING BUSY HOUR LOADS VIZ 10 A.M. TO 12 NOON.
AFTERNOON " " 2.30 P.M. " 4 P.M.
RECORD WAS TAKEN ON ONE REPRESENTATIVE DAY.

Mr. Rodger also states that it would have been possible for all the busy lines to have been put on certain positions and the quiet ones on other positions. The obvious reply to this is that the law of averages makes it impossible for such an occurrence to take place.

I cannot see, therefore, that Mr. Rodger has in any way proven his case or disproven mine; the particular queries raised are (with the exception of the one *re* position and panel loads) side issues of the main question which, if discussed at length would tend to confuse the principle involved.

Can Mr. Rodger assure us that in any exchange requiring distribution (which by inference suggests overloading), (*a*) it would be possible for the operators to give exact records of the calls on individual lines; (*b*) a representative period could be chosen to get normal traffic on all lines?

At any rate, and to quote Mr. Rodger's own phrase, his objections to the Bristol scheme "are more hypothetical than real." He assumes what would occur under such a scheme, whereas we have been working on the new basis for six months with excellent results; and no "finishing touches" were necessary once the main scheme had been carried out.

I would also reiterate a previous statement of mine that "the same result would obtain in any exchange going through a similar process," and if "*Facts are chiels that winna ding*" the "*Proof o' the pudding is the preeing o't.*"

In conclusion I heartily join with Mr. Rodger in the hope that the correspondence will effect the best solution of the problem, and also that we may have the views of other "traffic men" on the subject. I feel indebted to Mr. Rodger for the courteous manner in which he has handled the subject, which I trust will be kept clear of the personal element in any shape or form.

Bristol. A. E. COOMBS, Exchange Manager.

ATHLETICS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to the letter in the October number from Mr. W. King, of Manchester, I should like to suggest a form of athletics that would only entail one journey, thereby curtailing expenses, viz., a cross-country race. There

are no doubt in every large centre members of the staff who are connected with a local harriers' club.

A cross-country race (after the style of the "National" cross-country race) could be arranged and decided at, say, some town in the Midlands, each team entering to pay an entrance fee of 5*s.* or 7*s.* 6*d.*, which would help to buy medals for the winners. We should then be able to herald the staff of — centre as the "Champions of England." I shall be glad to hear from anyone interested.

Leeds, Jan. 15. A. DUTTON.

TELEPHONE MANNERS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the leading article under the above heading in the last issue of the JOURNAL there are one or two points about which I should like to make a few remarks. The writer of this article states that it will be remembered that when some considerable time ago an order was issued by an American company for the abolition of the use of the word "please" when answering a subscriber, a strong feeling was evoked in this country for its retention. Possibly it may be due to my lack of information on the subject, but I cannot recollect that at the time this order was issued by this American company any discussion took place or any general expression of opinion was given by telephone men in this country about the matter. About nine months ago, however, I wrote a letter to the JOURNAL putting forward the suggestion, in the hope that it would be fully discussed, that the time had now arrived for dropping the use of the word please and using "number" only when answering a subscriber. This suggestion you promptly judged and condemned in a footnote to my letter, thus to a large extent biassing the opinions of the readers of the JOURNAL, in fact you tried the case yourself, so to speak, and condemned the prisoner and then handed him over to the jury to try him again if they felt disposed to dispute your judgment. In the few letters that followed mine I cannot find that there was a strong view expressed that the word please should be retained, but several writers expressed the view that some other word altogether should be used. Now in this article it is stated that a remedy will hardly be found for the alleged discourtesy on the part of operators in the plentiful peppering of "pleases" in the new instructions issued by the Post Office, for after all "it is the tone of the voice which really conveys politeness and the sense of being willing to oblige, and that brevity is a weighty consideration in telephone correspondence." These last few lines are the essence of my contention that to use the word "please" as well as "number" is quite unnecessary.

From observations made over a considerable period I find that quite 70 per cent. of our subscribers do not use the word "please" when asking for a number, but consider it quite sufficient to give the number required and name of exchange if necessary when replied to by an operator, and they probably do not for a moment consider such procedure a form of impoliteness or discourtesy to the operator.

All the subscriber requires, I submit, is a prompt answer to his call, and anything beyond this is superfluous and absolutely unnecessary, and the one word "number" properly intonated notifying that the subscribers instructions are ready to be taken by the operator certainly seems to me to be all that is really necessary, and that nothing whatever is gained by the constant parrot-like repetition of the word "please" also.

Bath, Jan. 15. W. C. OWEN.

[We should hardly expect that an editorial note at the foot of a letter disagreeing with any particular view put forward in such letter would closure discussion on it, or bias the opinions of correspondents. Whilst we do not advocate the dropping of the word "please," we are so far in accordance with Mr. Owen's former letter that we consider the tone of voice of more importance in conveying a sense of politeness than actual words. The purport of our editorial of January was to defend the operators from the implied suggestion of impoliteness conveyed in the Postmaster-General's circular, and to point out that "please" was already part of their usual formula.—ED., "N. T. J."]

GLOUCESTER DISTRICT MUTUAL BENEVOLENT SOCIETY.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN January, 1908, a benevolent society was formed, Mr. R. A. Dalzell, Provincial Superintendent, being president. Mr. D. B. Fulton, vice-president, and the committee as follows:—Miss Harrhy, Messrs. J. L. De Medewe, W. J. Hodgetts, W. J. Norman, F. W. Sceates, W. A. Taylor and J. Savory; hon. secretary, S. G. Hare; hon. treasurer, H. Millett; and hon. auditors, T. H. Thompson and R. J. White. The total of membership for the district, from Cheltenham, Evesham, Gloucester, Hereford, Stroud and Lydney numbered 89. Each member paying 3*d.* per week secures sick benefit for eight weeks.

The receipts for the year ending Dec. 26 amounted to £52 17*s.* 8*d.*, and the expenditure as follows:—Sick pay, £20 8*s.*; refunded to members leaving the Company's service or transferred, £1 15*s.* 9½*d.*; books and stationery, 17*s.* 6*d.*; travelling expenses, 8*s.* 2*d.*; banking expenses 7*s.*, and postage 9*d.*; total, £23 17*s.* 2½*d.*

The balance, £29 0*s.* 5½*d.*, was divided among the members, and met with general satisfaction.

This information may assist in showing what can be done in a small but scattered district by co-operation and enthusiasm, also to encourage other districts in starting similar societies where not formed. S. G. HARE.

"THE TERRITORIAL FORCES."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I READ with interest Mr. W. H. Grinsted's excellent article on the above, and as a late country member of the E.E.R.E. Volunteers, I can fully endorse his remarks.

The snapshots are excellent, and bring back to me pleasant recollections of the annual trainings, and also my visits to the headquarters at Westminster S.A. . . .

I strongly recommend this volunteer corps to members of the staff, especially those who are engaged in town, as they have the advantage of the headquarters, which is fitted with many interesting electrical equipments. Not only does one derive benefit physically, but a lot of useful electrical knowledge.

Leicester. P. V. SANSOME (No. 1,015).

HIC ET UBIQUE.

THE race of Who-is-Connie-Gilchrist? judges is not extinct. The latest representative of judicial nescience is Judge Willis, who is reported to have said that he had not seen a telephone. With a masterly touch of high comedy he added that he supposed it was a reality. Judges also have been held—especially by the criminal classes—to be realities.

WE have from time to time reported instances of charity practised by the staff, and have to add that in the Glasgow district £205 was distributed recently between the hospitals and infirmaries in the district and £21 was forwarded to the Lord Provost's Unemployed Fund. In Cardiff £19 17*s.* was handed to the local hospitals, and the Italian Earthquake Fund received over £7 from the Nottingham Factory. Lastly, a report in a Bolton paper records how the operators purchased and dressed a number of dolls for the poor children of the town.

A BIRMINGHAM operator was recently the cause of arresting a fire at Small Heath which she promptly reported to the fire brigade before the first outside alarm reached them. She was warmly commended by the officer of the brigade.

NATIONAL TELEPHONE PROGRESS.

DURING the month the following new exchanges have been opened:—Kildare (Dublin district), Bovey Tracy and Buckfastleigh (Exeter), Comrie (Dundee), Hornby (Preston), Haigh (Warrington), Betchworth (Guildford), Ennis (Cork), and Hurstmonceux (Brighton), making a total of 1,545 now open. The new stations added during December numbered 2,600 making a grand total of 475,899.

Huddersfield.—The underground scheme is now nearing completion. About 20½ miles of cable have been laid by the Post Office, and the whole of the overhead plant is being entirely reconstructed. Five 600-pair and one 400-pair cables run into the exchange, and there are 83 distributing points. The first wires working in the new underground cable were put through on Dec. 15 last, and they are now being joined up as rapidly as possible.

Brighouse.—The Company's plant here has been reconstructed and looped by means of aerial dry-core cable, and the work is now practically completed. Some 2½ miles of cable ranging from 25 pairs to 100 pairs has been run out, and twelve distributing points established.

Cambridge.—On Jan. 16, at noon, the earth circuit system was abandoned and a new underground metallic circuit system brought into use. At the same time a new central battery exchange was opened in premises in Alexandra Street, built specially for the Company's purposes, and known as Telephone Buildings. The change over to new system, notwithstanding the fact that premises, exchange system and distribution were new, was accomplished without any difficulty.

Dublin.—A considerable extension of cable has recently been made in the south side of the city, viz., 6,865 yards, representing 430 miles of cable; and 6,955 yards of cable are about to be provided on the north side of the city, equivalent to 802 miles of wire. The latter work is in progress. The extension of the switchboard at Ballsbridge Exchange by two 100-line sections is nearing completion. The work of providing four sections of 1,100 lines in Dublin Central Exchange is in progress of completion.

Bognor.—An extensive underground system has just been completed in Bognor. Underground cables have been laid in West Street, High Street and Aldwick Road. The scheme extends from the east to the west of the town, reaching as far as Aldwick.

Crosby.—New Common Battery Exchange.—The work of installing the equipment at the new exchange was commenced on Jan. 8. The exchange is designed to accommodate 2,000 lines, covering developments until 1915. The main frame for the present will be equipped for 1,200 lines, thus providing for the requirements to 1912.

competitive papers on "Line Construction," to be read by linesmen only, and first and second prizes of 5*s.* and 2*s.* 6*d.* respectively were offered. Papers were read by the following foremen and linesmen:—Messrs. Smith, Westlake and Gill. A few interesting suggestions were made regarding the improvement of duck-boards, guys for derricks and sound deafeners. The first prize was unanimously awarded to Foreman Smith, the second prize going to Foreman Westlake.

Cardiff Operators.—The fourth meeting was held on Jan. 12. The subject for the evening, "Some Important Matters in Operating," was given in the form of a debate. Miss Richards (Clerk-in-Charge, Barry) taking the affirmative side, supported by Misses White and Strange, of Barry; and Miss Osborne, Supervisor, Cardiff, took the negative side, supported by Misses Bryant and Palmer.

Cheltenham.—The fifth meeting was held on Dec. 22, Mr. A. D. Pike (vice-president) in the chair. An exceedingly well-written paper on "Faults," was given by Mr. A. T. Taylor.

The sixth meeting was held on Jan. 5, when Mr. D. B. Fulton gave a paper on "Transmission," illustrated by lantern slides and large scale diagrams.

Cork.—At a meeting held on Dec. 11 (Mr. A. M. Kidd, District Manager, presiding), Mr. Chamney read a very interesting paper, entitled "Measured Rate Accounting and Revenue."

Another meeting of the society was held on Dec. 18, the District Manager, Mr. A. M. Kidd, also presiding, at which Mr. J. Roy, Chief Inspector, read a lengthy and very instructive paper on "Faults and their Remedies."

Cornwall.—There are three meetings to report on for this month, which are as follows:—On Nov. 18 Mr. W. S. Griffiths read a paper on "Overhead and Underground Construction." On Dec. 9 Mr. H. W. Roberts, Inspector in Charge, Penzance, read a paper entitled "Exchange and Instrument Faults and How to Clear Them." On Dec. 30 Mr. J. Wilkinson, Local Manager, Truro, gave a paper entitled "The Importance of Detail in Telephone Work," his chief points being on instrument work.

The meetings of this society are held every three weeks at the local offices, Truro, the membership fee being 6*d.* for the session.

Dover.—There was a good muster of the staff present at the third meeting, held in the district offices on Dec. 22, when two excellent papers were given, as follows:—"Overhead Construction and the Process of Creosoting Poles," by Mr. J. Allen, Foreman, Folkestone; "Limited Rate Recording," by Mr. J. Law, Chief Clerk, Dover.

Dublin.—The papers already read and discussed include the following subjects:—"Canvassing," J. O'Beirne; "Mathematics as Applied to the Company's Business," G. Sutcliffe; "Sub-Exchange Construction," G. Kirkwood; "The Transmitter: its Theory, and Construction," W. Higson; and "Stores Accounting," C. J. Purcell. The fifth meeting of the session was held in the superintendent's office on Jan. 6, Mr. M. E. Connor, Chief Electrician, in the chair. A paper was read on "The Inspector, the Fitter, and the Public," by Mr. R. H. Gilliland, Assistant Electrician. The meeting was attended by 62 per cent. of the total members.

The following complete the syllabus:—1909: Jan. 27, "Fitting and Faults," A. W. Dalton; Feb. 17, "Development as seen from P.S.O.," A. Lynn; "Inspection," J. Tyrrell; March 10, "Ireland's First C.B. Exchange," F. C. Scannell; March 31, "Measured Rate Accounting," T. J. Early; April 21, "Lantern Exhibition," R. B. Graham.

Exeter.—On Jan. 5 a paper, "Co-operation," was read by Mr. W. Sim. On Jan. 19 the subject was "Instrument Inspector's Troubles" by Mr. C. R. Parkhouse.

Glasgow.—A meeting was held in Technical College on Jan. 13. Mr. Thyne presided, and having explained that the paper to be read was the joint production of Messrs. Murray, Keir, Warnock and Graham, he called on Mr. Murray to deliver it. The subject was "Some Economic Points in the Construction of Line Plant." A number of slides were shown to illustrate how routes ought not to be erected.

Glasgow Operators.—The third meeting was held in the Masonic Halls, 100, West Regent Street, on Dec. 28, when Mr. Brough, Assistant Electrician, gave his paper on "Exchange Apparatus and its Maintenance." Thereafter the third meeting of the club was held, when a programme of songs and readings was contributed by members.

Gloucester.—The third meeting was held on Jan. 7, Mr. D. B. Fulton, District Manager, being in the chair. Two papers were read, the first by Mr. W. J. Hodgetts, Local Manager, Stroud, on "Aerial Cables and General Overhead Construction." The second paper was by Mr. G. R. Collings, Instrument Inspector, on "Party Line Working." Opportunity was also taken by the District Manager, on behalf of the members of the benevolent society, to make the presentation of an art copper fern pot to Mr. S. G. Hare, hon. secretary, and a briar pipe in case to Mr. H. J. Millett, treasurer, in recognition of their services rendered to the fund during the past year.

Greenock.—The fourth meeting was held on Dec. 16, Mr. A. Ramsay Lamb, president, being in the chair. Three lectures were given—the first by Mr. J. P. Ross, Cost Clerk, on "Expenditure"; the second by Mr. Thomas Smart, Stores Clerk, on "Material"; and the third by Mr. James Lowe, Wages Clerk, on "Wages."

Hanley.—The second paper was read on Dec. 10 by Mr. H. Watkin. The chief points dealt with were the theory of Ohm's law, and absolute and practical units. The programme for this session is now complete. Mr. Coleman has kindly consented to act as president, Mr. J. Scott, Assistant Provincial Superintendent, Mr. A. E. Ruddock, District Manager, and also Mr. T. H. Schofield and Mr. S. E. Goodwin have been elected as vice-presidents. The following papers have been promised:—"Wireless Telephony," Mr. F. Gresswell; "Surveying for Pole Routes," Mr. W. E. Hurlbut; "Some Notes on Management," Mr. J. Scott; "Telephone Transmission," Mr. J. Frost. A night is being given to short competition papers. The following members have entered:—Messrs. R. E. Deakin, T. Woodyatt, F. C. Butterworth, W. Edwards, J. Rodger and F. Davies.

On Jan. 7, Mr. Gresswell read a very interesting paper on "Wireless Telephony." Mr. Schofield took the chair. The following points were dealt with:—(*a*) The history of the subject. (*b*) Comparison between wireless telegraphy and wireless telephony. (*c*) Three essential things to both telegraphy and telephony: (1) a means of producing Hertzian waves, (2) a means of propagating Hertzian waves, (3) a means of detecting Hertzian waves.

Hull.—According to the syllabus, the paper for the meeting held on Dec. 18, was to be given by Mr. Riley, but owing to the transfer of Mr. Morgan to Dublin, he and Mr. Riley changed dates, and Mr. Morgan gave his paper entitled "The Training of an Operator."

Isle of Man.—The third meeting was held on Jan. 8, Mr. Street of the Engineer-in-Chief's Department presiding. There were present thirteen members of staff, also Foreman White and men lent from Birkenhead to help with storm repairs. The District Manager (in place of Foreman Martin whose paper was not ready) read a paper entitled "Lessons to be Learnt from the late Breakdown."

Kilmarnock.—A meeting of the Ayrshire District National Telephone Society was held on Jan. 13, when a paper was read by Mr. J. C. Dalziel on "Telephone Diplomacy." Mr. W. R. Kenneth was in the chair.

The second ordinary meeting was held on Jan. 8, Mr. J. Grant in the chair. The subject, "Some Notes on Outside Construction," was dealt with by Mr. Douglas Fowler, District Engineer, and an interesting discussion followed.

Leeds.—The second part of session was opened on Jan. 13 with a splendid address by Mr. J. Scott, Assistant Provincial Superintendent, Midland Province, a former District Manager at Leeds. A good number assembled to renew old associations and listen to his paper, which was entitled "Some Notes on Management."

Leicester.—An interesting paper on "Traffic" was read by Mr. P. V. Sansome on Dec. 20 to the members of this society, the president (Mr. Leonard Price) occupying the chair.

On Jan. 8 Mr. Ernest Rendell read a paper on "Exchange Maintenance and the Mercury Arc Rectifier."

Liverpool.—The fourth meeting of the session was held on Dec. 17, the president, Mr. Hidden, being in the chair. The paper under discussion was "Measured Rate Account Bookkeeping," and was read by Mr. Godfrey, Chief Clerk. He practically confined the whole of his remarks to the existing system, only briefly touching on the proposed system which is to be introduced on Jan. 1.

London.—A meeting was held at Salisbury House on Jan. 11. There was an attendance of 60. The president, Mr. H. Davis, was in the chair. Two papers were read, one by Mr. H. Bishop (of the Engineer-in-Chief's Department) entitled "Calculation of the Capacity required for Accumulators used in Common Battery Exchanges," and the other by Mr. G. Goldsmith on the subject, "Correspondence by Telephone."

London (Southern).—The monthly meeting of this society was held on Dec. 15, when a paper was read by Mr. G. H. Bryant, on "Induction Coils, Repeating Coils and Transformers." The composition of the coils and their functions was well described with the assistance of diagramatic slides.

Luton.—A meeting took place on Dec. 17, when Mr. S. Moody, Local Manager, Luton, gave a paper on "Overhead Work." As a fair percentage of the membership for the district resides at Watford, from which place it is difficult to get to Luton and return the same night, it has been decided that lecturers in future should be requested to repeat their papers at Watford, the expenses incurred being met out of the society's funds.

Manchester.—On Dec. 11 a paper was read by Mr. A. Stewart on "Copper and Bronze." After the paper a number of micro-photographic slides of copper in its various processes, and with various alloys, were shown and described by Mr. Baty, Research Chemist of the British Insulated and Helsby Cable Company.

Newcastle.—The second meeting was held on Dec. 17, F. W. Gaskins being in the chair. There were two papers; the first was given by Mr. G. W. Watson on "Instrument Faults." Several sketches were neatly executed on the blackboard, showing Ericcson table and new pattern wall sets, together with smaller drawings of parts of the instruments. The second paper was given by Mr. J. Gilroy on "Stores and Stores-Keeping."

Nottingham.—Mr. F. H. Roberts, Switchboard Construction Inspector, of Birmingham, read a paper relative to "Exchange Construction" on Jan. 5. Considerable discussion took place at the end of the paper, there being a fairly good attendance.

Nottingham Factory.—The fifth meeting took place on Jan. 11, 153 being present, when Mr. B. S. Cohen, of the Engineer-in-Chief's Investigation Department, gave a most interesting lecture on "Transmission Testing," illustrated by slides and apparatus. Mr. Fenton occupied the chair, and extended a warm welcome to the members of the Nottingham District Society present.

Plymouth.—A meeting took place on Jan. 6, when two papers were read, one by Mr. C. Mullins on "Underground Construction," and the other by Mr. G. Foster on "Wireless Telegraphy."

Portsmouth.—On Nov. 14 last, Mr. J. Lees gave a paper on "Central Battery Working," which was illustrated by lantern slides and diagrams of typical circuits.

On Jan. 11 Mr. Legge, Engineer, Portsmouth and Isle of Wight district, gave a paper on "Transmission." The lecture was illustrated by some very good diagrams.

Sheffield.—On Jan. 15 an interesting paper was read by Mr. E. J. Johnson on "Up-to-Date Telephone Exchanges and Traffic Methods." The paper was illustrated with a large number of lantern slides.

Swansea Operators.—The fourth sessional meeting was held in the Docks Exchange Hall on Jan. 13, when an extremely interesting paper was given by Mr. W. E. Gauntlett (District Manager), entitled "The Little Things which Count." Mr. R. Williamson (Local Manager, Swansea) occupied the chair.

Tunbridge Wells.—The second meeting of the society was held at Ralph's Restaurant on Jan. 12. The lecture was given by Mr. Sudell on "Overhead Construction," the Local Manager, Mr. Curling, in the chair.

Wolverhampton.—The January meeting was held in the Town Hall Restaurant, Wolverhampton, on Jan. 15, when two much appreciated papers were read, one by Mr. R. S. Grosvenor, Walsall Local Manager, on "Lightning Effects on Dry-Core Cables," and the other by Mr. F. Lucas, Contract Manager, on "Views and Interviews." The number present was 40.

Western (Metropolitan).—A meeting of this society was held at Gerrard Exchange on Nov. 26 last on which occasion Mr. G. F. Greenham (Metropolitan Electrician) read a paper entitled "Private Branch Exchanges."

A further meeting of the society was held on Dec. 17, when Mr. A. Holmes read a paper on "Testing Units." This was descriptive of the testing position in use at Gerrard Exchange and fully explained the apparatus and its objects.

STAFF GATHERINGS AND SPORTS.

Cardiff.—The annual social gathering of the telephone society was held at the Whitehall Rooms, Cardiff, on Dec. 10. The gathering numbered about 181 of the staff and their friends. Whist and dancing, interspersed with musical items, were indulged in during the evening, and thanks are due to Miss Lathey, Miss Merrett, and Mr. Tony Lucas for so generously contributing towards the evening's enjoyment. Eight prizes were offered for the whist, and the two given by the Provincial Superintendent were won by Mr. Chas. Hooper, Cardiff, and Miss van Riel, Cardiff. A happy evening was spent, and the function was brought to a close about 2 a.m.

Nottingham.—The district staff held their first whist drive and dance of the season at the Arboretum Rooms, Nottingham, on Nov. 28. An enjoyable evening was spent by those present, among whom were Miss J. Tait (Clerk-in-Charge), Messrs. J. Sneath (Chief Clerk), S. Firth, (Provincial Superintendent's Office), J. A. Bonathan (Local Manager, Nottingham), W. Haimes (Contract Manager, Nottingham), and S. A. Young (Local Manager, Derby). The winners of the prizes for the whist drive were Mesdames Drake, Bradshaw and Richardson, and Messrs. Squires, Whin and Bonathan. Dancing was kept up until 11.30 p.m.

The operating staff held a social evening, comprising music, whist and dancing at the Gladstone Club on Wednesday evening, Jan 13. There was an attendance of over 100, and the organisers (Misses Fleet and Stevenson, and Mr. Wigley) are to be congratulated on their efforts.

Southern District (London).—The first annual dinner and smoking concert of the Southern Exchange construction and fitting staffs was held on New Year's night at "Ye Olde Horseshoe Tavern," Borough, S.E., Mr. G. A. Payton presiding. The evening was a great success, and the programme met with hearty approval. Speeches were made during the evening by Messrs. G. A. Payton, J. Angier and J. Roden. The programme was under the management of Mr. A. G. Freestone.

Norwich.—The local telephone association arranged a mixed whist drive on Dec. 21 at the Criterion Restaurant, Norwich. Thirty-one tables were set, 124 players competing for sixteen prizes. The ladies' first prize went to Miss Sluman, and the gentlemen's first prize was won by Mr. Priestley.

On Jan. 14 another whist drive was held at the same place. Thirty-one tables were set, and 122 players competed for fourteen prizes. The first prizes were won by Mrs. Bilham (ladies') and Mr. Johnson (gentlemen's). Mr. H. H. Wigg acted as M.C. on both occasions.

Oldham.—A very successful whist drive was held at the Café Monico, Oldham, on Dec. 30. About twenty tables were in use. The first gentlemen's prize fell to Mr. Turner, the second to Mr. Cheethem. The first ladies' prize was secured by an outside friend, and the second by Mrs. Cheethem. The remainder of the evening was occupied with songs and dancing.

Huddersfield.—The Huddersfield operating staff held their annual whist drive and dance on Dec. 11, when a company of 76 were present. The prizes were distributed during the interval by Mrs. Wicker, wife of the Huddersfield Local Manager. Dancing was then engaged in, and altogether a most enjoyable evening was spent.

Halifax.—A very successful whist drive and dance was held at the Café Royal on Dec. 4, there being 130 persons present, consisting of the staff and their friends, amongst whom was Mr. Wicker, the Huddersfield Local Manager, and Mrs. Wicker. The prizes were presented by Mr. Stelling, Local Manager, Halifax, and a very pleasant evening resulted.

Nottingham Factory.—A very successful and enjoyable whist drive was held in the Mikado Café on Jan. 15. Over 80 were present, including representatives from the Engineer-in-Chief's Department and Nottingham district staffs. There were eight prizes, and these were keenly contested for.

Cheltenham.—An exceedingly interesting and well-attended lecture on "Gloucester Cathedral," illustrated by electric lantern slides, was given here on Jan. 8 by Mr. A. D. Pike. Mr. D. B. Fulton (District Manager) with Mrs. Fulton, and a number of the Gloucester staff, attended. A social gathering and dance followed, the revels terminating at a late hour.

Birmingham.—The electrical staff had their annual dinner on Jan. 18, when about 70 members, including Mr. Cornfoot, Mr. Bagley, and Mr. Gatty, were present. Mr. Williamson (District Manager) presided, and proposed the toast of the "National Telephone Company," in which he urged the necessity for harmonious working among all members of the staff. In the subsequent smoking concert by members of the staff the songs by Messrs. F. Brown and L. Martin were particularly appreciated. The committee, Messrs. Price, Medlicott Bayliss, Dale, Brown and Morgan, were congratulated on the result of their efforts.

Hull.—*Staff Cricket and Tennis Club.*—A most enjoyable Cinderella was held on Dec. 29 at the Salisbury Hall, Hull, 95 persons being in attendance. The M.C.'s were Messrs. J. A. Gomersall and H. B. Pegden, of the Hull staff.

Edinburgh.—The staff held their annual dance in Aitchinson's Rooms, Queen Street, Edinburgh, on Jan. 15. About 100 were present and the gathering was very enjoyable

Brighton.—The Brighton staff assembled at Forfar's Restaurant, Western Road, at a whist drive, the arrangements for which had been admirably made by Mr. O. S. Flower, Service Inspector. Among the company present were the District, Local and Contract Managers and several members of the Post Office staff. The first ladies' prize was won by Miss Gertrude Huxtable, and the first gentlemen's prize by Mr. A. Tyler.

London.—*Chess Club.*—The following are the results of the matches played since the last issue of the Journal:—

		Points. For.	Against.
Jan. 5, *v.*	London County Council (home)	4½	5½
,, 12, *v.*	Paymaster-General's Office (away)	7½	4½
,, 19, *v.*	Engineers' Dept., General Post Office (home) ..	5	7

BENEVOLENT SOCIETIES AND THRIFT CLUBS.

LIVERPOOL AND BIRKENHEAD BENEVOLENT SOCIETY.

IMMEDIATELY on the formation of the above society a suggestion was made by the president, Mr. E. J. Hidden, that a concert might be held with a view to forming a nucleus for the funds, and placing the society in a position to be able, if required, to render immediate assistance to members. The suggestion was taken up by the committee in a most enthusiastic manner, and various sub-committees, comprising members of the staff, were formed to carry out the necessary details, and no pains were spared to make the venture a success in every way. The concert took place on Dec. 18 at Hope Hall, the attendance numbering close upon 1,000, and not only was every branch of the staff represented, but the attendance of the public amply testified to the energy of those who had been responsible for the sale of tickets amongst subscribers and their friends. A high-class programme, the arrangement of which was entrusted to Mr. J. H. Swain (Central Exchange Manager) was put before the audience. Space prevents us making individual mention of the names, but the President took advantage of an interval in the programme to tender his high appreciation and thanks to the artistes and members of the staff, as well as the public for the hearty manner in which one and all had responded to his wishes.

At a meeting of the committee held on Jan. 6, the President was pleased to announce that as a result of the concert the funds of the society would be strengthened by the substantial sum of £29 4*s.* 2*d.*, a result highly creditable to all concerned. Donations of £2 2*s.* have been received from Mr. G. Hunter Robertson, of £1 1*s.* from Mr. F. Gill, and of £5 5*s.* from the Liverpool Central Operators' Dining Club, this handsome addition to the funds being especially welcome. Additional donations have been promised by other gentlemen interested in the society. Up to the present about 750 members of the staff have joined, and there are indications that this number will be increased.

BRIGHTON TELEPHONE STAFF BENEVOLENT SOCIETY.

THE annual meeting was held at the Ship Street offices on Jan. 13, Mr. Parsons in the chair. The officers for the ensuing year were chosen, the president, vice-presidents and trustees being re-elected. A vote of thanks to the retiring auditors (Messrs. T. Williams and O. S. Flower) and to the collectors was passed. It was noted with satisfaction that the Company had with much kindness allotted a substantial and regular contribution to the funds. The society's work during the past year included the grant of assistance in seventeen necessitous cases, at a cost of £21 5*s.*, and the maintenance of one of its members for three weeks in a convalescent home. Amounts were contributed to medical charities as follows:—Sussex County Hospital, £3 3*s.*; Brighton and Hove Dispensary, £5 5*s.*; Throat and Ear Hospital, 10*s.* 6*d.*; Eye Hospital, 10*s.* 6*d.* Fifty-three letters for the various institutions were issued to members. The balance in hand is satisfactory.

NATIONAL TELEPHONE PROVIDENT SOCIETY, NOTTINGHAM.

THE general meeting of the society took place in the Company's office, on Dec. 18. The secretary reported as follows:—Contributing members, 135. Accumulated funds for the year, £75. Number of members who have received benefit during the year 42, £28. Balance in hand, £50. Distribution of funds, the following grants were made to charitable institutions:—

Nottingham General Hospital	£15
Derby Hospital..	3
Lincoln Hospital	1
National Lifeboat Institution	1

A refund was granted to all members of the society who have been upon the society's books for the whole year, and have not drawn sick pay, at the rate of 4*s.* for the year, less any payments which may be in arrears.

BIRMINGHAM AND DISTRICT SICK, DIVIDEND AND BENEVOLENT SOCIETY.

THE annual general meeting of the above society was held at Birmingham district office on Dec. 8. Mr. Warwick Bagley, the president, on opening the proceedings, complimented the society on the success achieved during the past year, and Mr. Williamson, the District Manager, congratulated the society on its sound and prosperous condition. The balance sheet exhibiting a balance of £60 8*s.* 9*d.* was considered to be very satisfactory. The officers were unanimously re-elected.

The society although it has only been started a little over twelve months has now a membership of 120 and is gaining favour amongst not only the members of the Birmingham staff, but also those of adjoining districts. Several new members were enrolled at this meeting and it is anticipated a good many more will join during the coming year.

THE GLASGOW DISTRICT TRAFFIC DEPARTMENT BENEVOLENT FUND.

Cake and Candy Sale.—The above sale was held in the Masonic Hall, 100, West Regent Street, Glasgow, on Dec. 19, and proved a most gratifying success. The attendance at all times was large, and the visitors heartily responded to the many temptations to spend. The opening ceremony was performed by Mrs. Watson, wife of Mr. F. Douglas Watson, Superintendent for Scotland, who presided. Mr. Watson briefly alluded to the pleasure it gave him to preside, and Mrs. Watson in declaring the sale open hoped that the result would be in keeping with the excellent fare provided. Votes of thanks to Mrs. and Mr. Watson, proposed respectively by Messrs. Valentine and Rodger, were heartily accorded, and the presentation of a beautiful bouquet of flowers to Mrs. Watson by Master Tom Rodger completed the opening ceremony. Active operations by the bright and daintily dressed young ladies at the stalls thereupon commenced, and proceeded with marked effect throughout the evening. The drawings for the evening amounted to £85, and, including donations and goods previously and subsequently disposed of, the total drawings amount to £120, an excellent response to the ungrudging labours of the committee and the many other members of the staff who supported them. The committee take this opportunity of tendering their best thanks to all who by word or deed contributed towards this magnificent result.

Savings Bank Society.—A properly constituted society for the encouragement of thrift among the members of the Traffic Department staff was successfully inaugurated in several exchanges in the beginning of October, and since then has been largely taken advantage of. There is a membership of 226, and the deposits up to Nov. 16 amount to the respectable total of £63 14s. 4d.

The funds are banked with the National Security Savings Bank, who very kindly provided the branches of the society with members' pass books, cash books, and ledgers similar to those provided to public school banks.

SWANSEA DISTRICT THRIFT CLUB.

THE annual general meeting of the above club was held on Oct. 21 for the purpose of electing officers and committee for the year 1908-09. The year ending September 1908 has been very satisfactory and several members have expressed how beneficial it has been to them as a means of saving money. The total membership of the club is 68, out of which 35 are operators.

The club enters upon its third year with a balance in hand of £22 0s. 1d., the total deposits having amounted to £208 9s. 6d., and the withdrawals to £187 10s. 6d.

BOURNEMOUTH SICK BENEFIT CLUB.

THE first year's balance sheet of the sick benefit club in connection with the Bournemouth staff was completed on Dec. 16, and in accordance with the rules the surplus funds were divided amongst the members. The fund has been very successful in the first year's working, and as a mark of appreciation of the services of the hon. secretary, Mr. F. Beal, a set of military brushes in leathern case was presented to him by the Local Manager on behalf of the members.

CARDIFF MUTUAL BENEVOLENT SOCIETY.

THE annual meeting of the above society was held at St. John's Schools, Cardiff, on Dec. 17. The reports presented showed that during the past year the society had been very useful and helpful to many members of the district staff. Fifty-six per cent. of the money paid in was returned to the members on Dec. 19 in the way of dividend.

EDINBURGH TELEPHONE THRIFT CLUB.

THE annual general meeting of the above club was held on Dec. 7. Mr. Robert Wilson, vice-president, took the chair. The treasurer's report stated that the amount collected for this (first) year was £381 17s. 9d., and the amount in hand at the close of the club's year was £85 3s. A letter was read from Mr. F. Douglas Watson, hon. president, congratulating the club on the success since its inception, and wishing continued prosperity. Mr. J. D. W. Stewart, in moving the adoption of the treasurer's report, commented on the increase of eighteen in the membership, the total now being 173, and urged that those who were already members should get others to join.

NEWCASTLE NATIONAL TELEPHONE THRIFT CLUB.

THE second annual meeting of the above club was held on Dec. 8, when the balance sheet was read, showing:

Balance in hand November, 1907 ..	£75	7	2
Cash received to November, 1908, including interest	166	2	3
Total	£241	9	5
Cash paid to depositors	94	4	8
Leaving a balance in bank	£147	4	9

There are at present 56 members on the books, showing an increase of eleven since November, 1907. Great satisfaction was expressed with the usefulness of the club. The meeting was closed after passing a vote of thanks to the retiring officers, who were re-elected for the ensuing year.

SHEFFIELD DISTRICT BENEVOLENT SOCIETY.

THE second annual general meeting of the above society was held on Saturday, Oct. 17, 1908. The society was formed in August, 1906. Since its inauguration £21 has been paid to members in sick pay. This has been found a great benefit in times of illness. There have also been two dividends to members, amounting to 16s. 6d. the first year, and 15s. 5d. the second year.

The balance sheet at July 25 showed an income and expenditure (including a dividend to 27 members at 15s. 5d., of £20 16s. 3d., and cash in hand, £8 4s. 8d.) of £40 8s. 3d.

NATIONAL PROVIDENT CLUB (LONDON).

THE following is the balance sheet of the above club:—

	Receipts. £	s.	d.	£	s.	d.
By Donation from treasurer (Mr. H. Davis) ..				1	1	0
,, Contributions	454	19	9			
,, Sale of rules	4	15	0			
,, Entrance fees	8	19	0			
,, Fines	0	16	9			
,, Levies (death)	97	6	6			
,, ,, (secretary and collectors)	26	17	3½			
,, Bank interest	1	10	0			
				595	5	3½
				£596	6	3½
	Expenditure					
To Deaths, six	60	0	0			
,, Sickness, 1,408 days	123	4	0			
				183	4	0
,, Withdrawals				13	16	9
,, Printing and stationery	10	0	2½			
,, Postage and poundage	4	18	3½			
,, Secretary, collectors, treasurer and auditors ..				29	19	3½
,, Shares				353	6	0
,, Balance in hand				1	1	9
				£596	6	3½

S. J. OXENHAM, A. B. RAINBOW, } Auditors.

F. G. BROWN, Secretary.

TELEPHONE BORES.

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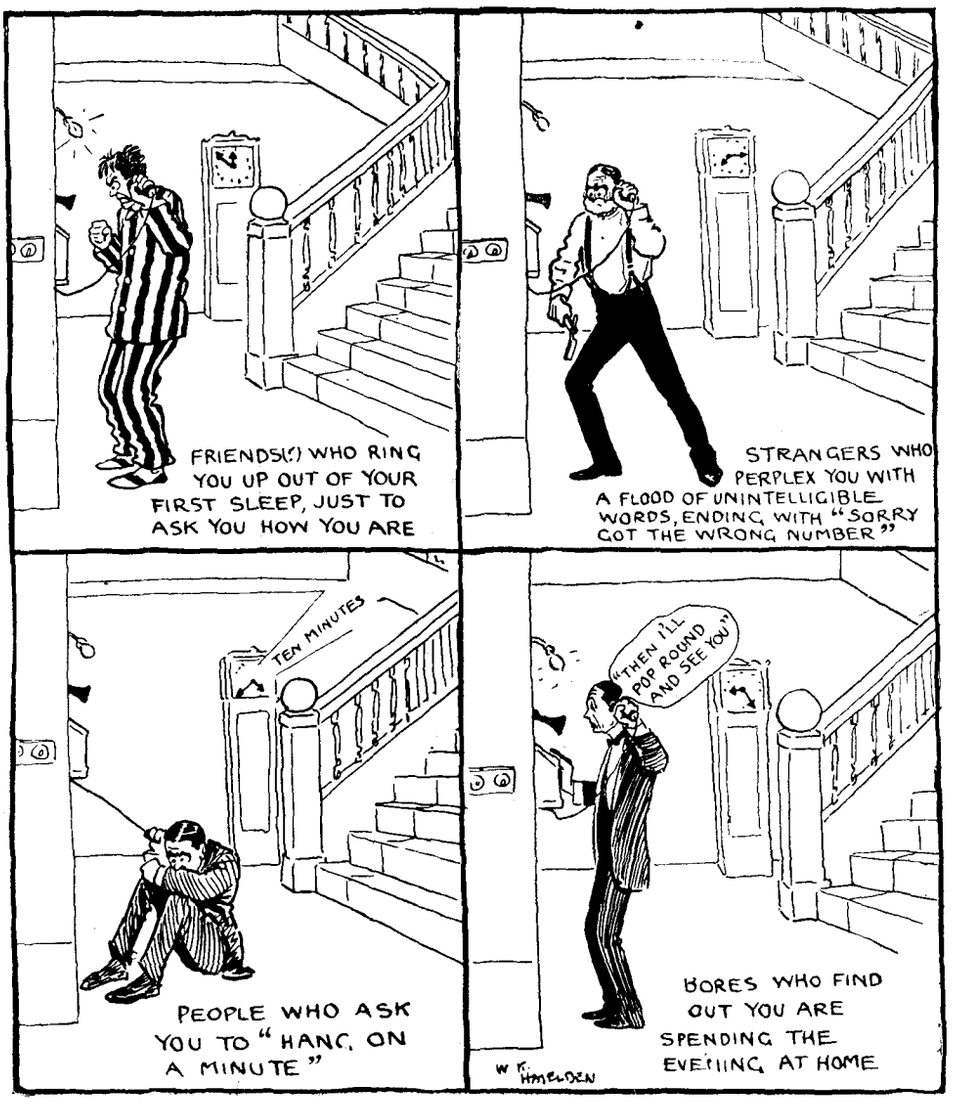
FRIENDS(!) WHO RING YOU UP OUT OF YOUR FIRST SLEEP, JUST TO ASK YOU HOW YOU ARE
STRANGERS WHO PERPLEX YOU WITH A FLOOD OF UNINTELLIGIBLE WORDS, ENDING WITH "SORRY GOT THE WRONG NUMBER"
TEN MINUTES
PEOPLE WHO ASK YOU TO "HANG ON A MINUTE"
"THEN I'LL POP ROUND AND SEE YOU"
BORES WHO FIND OUT YOU ARE SPENDING THE EVENING AT HOME
W. K. HAWDEN

THE
National Telephone Journal

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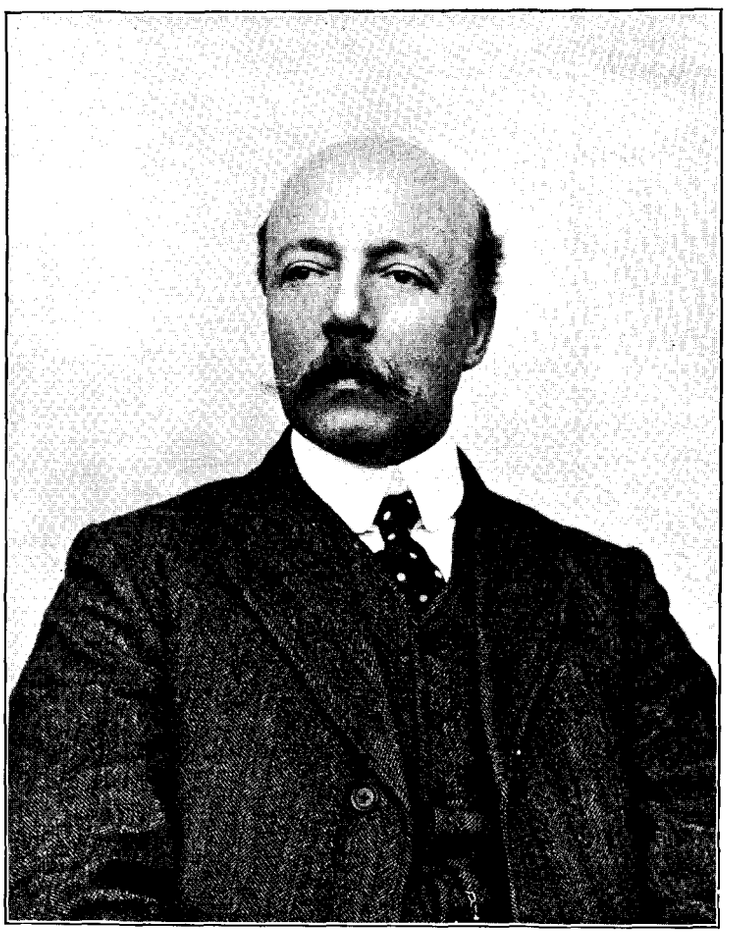
TELEPHONE MEN.

XXXIV.—ALFRED LAWRENCE EUGENE DRUMMOND.

ALFRED L. E. DRUMMOND was born at Scarborough in 1860, and was educated at Montgomery College, Sheffield, and Hallfield School, Bradford, under the late Dr. Watson. He left school early owing to a strong desire to get into business life, which appeared very much more attractive than school. This, he says, may possibly be explained by the fact that his acquaintance with the "tawse," wielded by a rawboned Scotch schoolmaster, was somewhat too intimate. He served his apprenticeship with Messrs. Crookes, Roberts & Company, engineers, Sheffield, with whom he had a varied experience, passing through several of the departments of their establishment. He has always entertained the highest regard for his old chief, Mr. Roberts, of that firm, who was one of the finest type of old-fashioned business men of his time. At the end of his apprenticeship Mr. Drummond went to London, but returned to the provinces after a short time and accepted an appointment with the late John Tasker (of Tasker, Sons & Company, Sheffield), in 1881, as Secretary and Assistant-Manager to the newly formed Telephone Exchange & Electric Lighting Company. There was more in the title than in the salary attached to the position, but it was the prospective electric lighting experience that attracted him, which however did not materialise, electric lighting prospects receiving a set back about this time. This was the parting of the ways, for he was perforce driven back on the telephone. Mr. Drummond has lively recollections of the various actions for infringements which were taking place in the early eighties, and had pretty nearly all types of the then known instruments under test. He left the above-named company in 1886 to join the National Company as District Manager of the Potteries, and whilst so engaged opened several exchanges, amongst others, Stafford, Derby and Burton-on-Trent. In those days these functions were of some importance and invariably accompanied by solemn festivities, which, it can be imagined, were congenial in the case of Burton. But it was not the "wine of the country" which the prospective subscribers (and others) consumed. The face of the then General Manager for the old Midland Counties District was a sight to be remembered when the refreshment account was submitted. After nearly two years Mr. Drummond was transferred to Leeds, whence, on the re-organisation, he was appointed to Manchester as Engineer, and subsequently to Oldham as District Manager. Here he stayed for four and a half years, being transferred in a similar capacity to Plymouth, where he remained for about five and a half years. In November, 1902, he was promoted to the Managership of the important district of Newcastle-on-Tyne, where he now is. Mr. Drummond believes that these varied and wide experiences have led to broadened ideas.



His hobbies are mainly mechanical. He admires good engineering as much as pictures, and is fond of workshop practice. He tried golf on going north but found that neither his game nor his temper improved, and that his vocabulary developed rapidly, if not politely. He is fond of the society of young men, and is interested in their advancement.

Mr. Drummond has been a loyal and devoted servant to the Company, and his only regret is that the license is not an indefinite one.

Since coming to Newcastle he has taken an active part in the affairs of the Institution of Electrical Engineers, and is now president of the local section. Of this position both he and the Company are justly proud, having regard to the men who have preceded him in the chair, and also to the fact that he is the first member of the staff to hold this responsible position in the Institution. We can only hope that more of the staff will be spurred on by Mr. Drummond's example to take an interest in and ultimately, we hope, to hold office in the Institution, remembering that it is the society to which all electrical engineers owe allegiance.

Newcastle is one of the few large cities where there has been active competition in the telephone business, and it is highly to Mr. Drummond's credit that under his management the Company's system is the more popular with the public, and maintains a large and increasing numerical superiority over the opposition system.

SOME OPERATING POINTS.

BY J. H. SWAIN, *Exchange Manager, Liverpool.*

(Concluded from p. 228.)

Measured Rate Service.—The introduction of the measured rate service has had a good effect in reducing the ineffective engaged calls, owing to the increase of private branch exchanges with additional junctions. In the year 1906, prior to the introduction of the measured rate service, the percentage of engaged calls was 20, and for 1908, with 21 per cent of the subscribers on the exchange transferred to the measured rate service, the percentage of engaged calls has been reduced to 15.

Busy Subscribers and Records of their Traffic.—It is not sufficient for the contract officer when interviewing the subscriber to inform him : "Your line is frequently reported engaged." He must have some evidence to prove that statement, and nothing is more conclusive and brings it home to the subscriber more effectively than a record which shows the number of ineffective calls made by his clients due to his line being reported engaged. Very little trouble will then be experienced in inducing subscribers to provide additional junctions.

I am informed by the contract manager that he finds these records to be of real material benefit to the contract officer, and instrumental in increasing the number of private branch exchanges; as, since these records were commenced, their number has increased from 54 to 246. It is surprising to find what a large number of subscribers have insufficient lines to accommodate their traffic. From 86 records taken no less than 15 per cent. show the necessity for additional lines and stations, and the contract manager has been successful in obtaining orders to the value of £300. The result has been so successful that a special operator has been sanctioned for the use of the Contract Department, who devotes the whole of her time to the taking of records on busy subscribers' lines, the method of recording being as follows:—

The originating and incoming calls are all dealt with at a special position, connection to which is made by transfer junctions: in the multiple of the subscriber's number is a peg indicating it is under record, and all calls are recorded on a special form, which is passed on to the contract manager.

"Copy" of Form.

Central Exchange.

RECORD OF CALLS.

Name Brown & Jones,
Address Castle Street.
No. 818.
Date December 10th, 7.

Time.	Originating calls.	Incoming calls.	Ineffective through lines being engaged.
9 to 10	3	1	2
10 ,, 11	10	6	16
11 ,, 12	15	6	4
12 ,, 1	9	7	6
1 ,, 2	2	4	5
2 ,, 3	6	2	3
3 ,, 4	5	6	3
4 ,, 5	12	3	14
5 ,, 6	2	2	4
	64	37	57

Can Common Number be made of present number? Yes.

Record Operator D. M. M.

Special Record of Engaged Calls.—In addition to these records, a special record is taken once every six months of all engaged calls to every subscriber on the exchange during one day from 9 a.m. to 6 p.m. This is done by dividing the exchange into sections, an order wire being provided common to all the operators in the section. The special record operator then having the line joined up direct on to an instrument provided for the purpose records the subscribers' numbers as they are passed to her by the operators dealing with the call, repeating the same to ensure the correct number being recorded.

Every number is reported both on "A" and "B" positions, irrespective of the number of times called for. These are summarised on the sheets in numerical order, from which the busy subscribers can immediately be distinguished, and the contract manager at once put in touch with the subscribers where new business is possible, without waste of time in calling on subscribers whose telephone equipment is ample for their requirements. Judging from the results obtained from these special records, I am convinced that in all exchanges of 1,000 lines and upwards, providing the majority of the subscribers are business people, it would pay us to provide an operator for the special purpose of recording subscribers' traffic. The cost of the operator's wages is infinitesimal in comparison with the amount of new revenue to be derived, and every additional line tends to increase the traffic in another direction.

The effect of subscribers transferring from the flat rate to the measured service is that the average calling rate per line decreases, while the number of junctions increase; the latter reduces the load of ineffective engaged calls and obviates the trouble arising through overloaded lines. From the following figures it will be seen that on six subscribers who transferred to the measured rate service the number of junctions increased by 55 per cent., and the calls per line were reduced by 30 per cent.:—

Subscribers' Numbers.	Before transfer.		After transfer.	
	Number of junctions existing.	Total number of calls per week.	Number of junctions existing.	Total number of calls per week.
A	2	266	3	299
B	2	177	3	216
C	2	103	2	71
D	1	200	2	125
E	1	109	2	118
F	1	90	2	160
	9	945	14	989

Private Branch Exchange Operating.—With the introduction of the private branch exchange the question of having qualified operators to operate them is becoming more popular with subscribers, and a new field is open to telephone operators for their labour. In Liverpool the Company are already supplying sixteen subscribers with fully trained and competent operators, one private branch exchange having four, three each having two operators, and twelve with one. In addition many subscribers have engaged their own operators, and in some cases they have been trained in the Company's operating school at the request of the subscriber.

There are still many who have not realised the benefits to be derived in having a competent operator, and generally have a boy, who, in addition to operating, has other duties to perform. It is obvious that he cannot give the attention that good service requires, and the answering of calls becomes a secondary consideration. Where the Company's operators are employed it is only to be expected that the attention will be better than that given by the subscriber. Possibly few are aware of the wide margin in the difference.

To give an example, the following observation has been made on the lines of two subscribers, "X" where the Company's operator was engaged and "Y" where the subscribers had their

own attendant. Both subscribers are very busy and have three lines:—

Name.	No. of calls.	Average answers.	Quickest answers.	Longest answers.	Percentage of calls answered in seconds.					
					2	3	4	5	10	20
		Seconds.								
"X"	161	6·7	3	19	—	9·8	31·1	51·5	86·5	100
"Y"	109	35	4	160	—	—	1·8	2·7	20·1	47·7

The following are a few of the notes made when the observations were taken on the "Y" subscriber's line:—

1. *Incoming trunk call.* (Operator rang three times.)	*The call was answered on three separate occasions by different persons who left the telephone after each call and took no further notice.*
2. Incoming local call.	Refused to accept same, and rang off, so as to get an originating call through first.
3. Calling subscriber complained of delay.	Replied "Cannot answer every line at once," and went away. Calling subscriber made another call.
4. Delay in answering.	Could not answer on account of switchboard instrument being used for a conversation.

Irregular and incompetent operating at private branch exchanges is a source of much trouble and its effect upon the service is felt in many ways.

1. Causes lost calls.
2. Causes unnecessary increase in monitors' work.
3. Causes a drag on operators in exchange.
4. Causes unnecessary complaints from the calling subscribers.
5. Causes loss in the carrying capacity of load of junction line.

Recording of Calls.—The question of the strictest accuracy being observed by operator in the recording of calls for statistical purposes should have the attention paid to it that its importance demands. So much depends on the operator's records, that, unless they can be absolutely relied on the service is likely to be seriously affected by improper distribution of the load, insufficiency of junctions, staff, etc., and, more important still, the possibility of the unnecessary expenditure.

It is assumed that it is generally known that records are taken by means of the peg count, and to ensure accurate recording it is necessary to have two sets of pegs, one for local recording (red colour) and one for junction recording (blue colour). The local pegs should be the upper one, and a portion of the multiple selected, where there is the least number of service pegs, providing it is within easy reach of the operator.

The operator should be impressed with the fact, that pegs must only be moved one at a time, and the exact moment for this to be done is when the operator has repeated the called subscriber's number. When she is busy, unless carefully supervised, she is liable to complete three or four calls before recording them, and afterwards tries to remember whether they are local or junction, which is disastrous to correct recording.

If the next jack into which the peg is to be inserted is already occupied by a service peg, the operator must insert her peg into the next vacant jack, thus taking no notice of the service pegs. At the expiration of each half-hour the "A" operators must immediately start with the second pair of pegs, and leave the supervisor to replace the pair previously in use.

At the end of each half-hour the supervisor will record the number of calls dealt with by the operators during that time, deducting the service pegs from the total. By these means it is possible to get an accurate record by peg count, and special checks have been made to find out with what degree of accuracy the operators were recording.

The method adopted was, that the checkers chose any position at the commencement of the half-hour and recorded all calls dealt with by the operator, and at the end of the half-hour compared her total with that recorded by the operator. The checks were made from the monitors' desk and, therefore, quite unknown to the operator, but any excess or deficiency was taken up with the operator at fault at the finish of the observation.

Employing these special checks is beneficial to the results obtained, as the operators never know when they are being observed, and are naturally more keen on carrying out their instructions.

From 231 checks made on various dates on which records have been taken, and accepting the checkers' figures in case as being correct, the total valued calls recorded by the checkers were 23,463, and the number recorded by the operators 23,445, showing the percentage of error of calls under-recorded by the operators to be ·07 per cent.

This result shows fairly accurate recording.

"WHAT'S IN A NAME?"

By W. A. VALENTINE, *District Manager, Glasgow.*

WHAT'S in a name? MONEY!

What thought has been given to the naming of some exchanges?

In looking over a telephone directory one finds it a common experience that exchange names consist of three, four and even five syllables (*e.g.*, Chorlton-cum-Hardy or Weston-super-Mare, which even the printers of the directory jib at, and print "Chorlton-c-h" and "Weston-s-m" respectively). The rule that has been generally followed is that of territorial designation: for instance, in a small town outside Glasgow an exchange was opened and called "Kirkintilloch Exchange." This entails a considerable waste of time on the subscriber's part, but, from the Company's point of view, there is also a serious loss of time on the operator's part (which can be expressed in £ *s. d.*), as in the event of a subscriber wishing to speak to Kirkintilloch she must wait on the line until she has heard the subscriber pronounce the four syllables of this lengthy name, and has repeated it to him.

If the present names of exchanges by any chance are in existence twenty years hence, our successors, I am afraid, will judge us harshly. Has the time not come for consideration of the whole subject? Could a system be devised by which exchanges would be named in a uniform fashion in all districts, the chief consideration being that the name of the exchange must never exceed one syllable?

The alphabet is ready to our hands, but it does not meet the needs of every district, as all the letters could not be used owing to the similarity of sound, and the available letters might not equal the number of exchanges.

If a *system* of naming can be found this would be advisable; but, in any case, the oscillograph might be brought into service and a set of distinctive one-syllable names decided on.

If the names were so distinctive as to indicate straight away to the operator whether the call was a local one or if a 1*d.* or 2*d.* junction fee were chargeable, this would be a further gain.

It would be a fruitful source of study for our statisticians to ascertain in money value the cost to the Company over the country in operators' time and equipment through the loss involved by the use of the larger names.

The Company has recognised the absurdity of the position by instructing its operators when speaking between exchanges to use abbreviations. If this is on the right lines, we should go further, and I suggest, Mr. Editor, that you might open your columns to a full consideration of the subject, so that the reproach may be wiped away at the earliest possible moment.

A DESCRIPTION OF THE MANUFACTURE OF THE COMPANY'S DRY-CORE CABLES, AND THE TESTING AND INSPECTING OF THEM.

BY F. D. LATIMER, *Cable Department, Engineer-in-Chief's Office.*

(Concluded from page 235.)

The rubber covering of dry-core cable prevails to only a minor extent, and is carried out by lapping a number of strips of rubber over the core, after which the cable is placed in a "cure," and the rubber vulcanised into a homogeneous mass; a compounded braiding and waterproof tapes forming the mechanical protection.

The lead covering of the cable represents the last manufacturing detail, and after immersion, it is ready for electrical test.

The qualities necessary in a metallic cable sheath are:

1. Tensile strength without excessive thickness.
2. Resistance to corrosion.
3. Pliability.

The first qualification is the most important, and to attain it an alloy is superior to pure lead. In connection with the second item, it appears to be an open question as to which sheathing is the more efficient, while for pliability the advantage lies with pure lead.

Although for similar thickness the alloy is considerably more expensive than pure lead, it has been proved that to obtain equal strength, the lead-tin alloy is the more economical, provided that the ratio of the prices of tin and lead does not vary very greatly from that at present and hitherto in force.

It is usually reckoned that in the Company's ordinary cables, the air occupies somewhere about 60 per cent. of the entire internal space of the lead pipe. Of course, in a high capacity cable, less air will be present. For the purpose of desiccating, ample air space is of value, and some buyers require that air forced at a certain pressure shall travel through the cable at a specified rate, the test being carried out by leading a small pipe suitably fixed to the distant end of the cable into a vessel of water, the engineer recording the time elapsing between turning on the cock from the pump and the appearance of bubbles in the water.

The Company's current specifications for dry-core cables present many features which mark a departure from those in force until comparatively recently. The principal of these are:

(1) The introduction of the use of copper weighing only 10 lbs. per mile (25 mils diameter). Formerly 20 lbs. per mile (36 mils diameter) was the minimum.

(2) The diameter of the cable is not specified, but is left to the manufacturer, a maximum of 2·625 inches only being fixed, so that it can be easily drawn into a 3-inch duct.

(3) Whereas an open braiding of cotton between the core and the sheathing was hitherto the invariable rule, a clause is now inserted permitting the use of two lappings of suitable paper.

(4) The capacity requirements as now given stipulate for the measurement to be made between two wires of a pair. Originally it was taken between any one wire, and all the remaining wires with the sheathing connected to earth.

(5) The setting forth of the number of pairs to form each layer.

We will briefly consider how these changes have affected the manufacturer of cable.

(1) In using a wire of smaller diameter, it is natural to expect the number of fractures that will occur during the various processes of paper covering, twinning and stranding will be increased, and there is reason to think that at the outset this was found to be so.

One cause of the trouble was the choking up of the "die" in which the wire is enveloped in its paper covering, due to some irregularities either on the surface of the paper or on its edge. As it is now the custom for the factories themselves to cut the paper to the requisite width, it being supplied to them in rolls, it is quite possible that the paper is more uniformly cut, which should permit the wire to run through the "die" with greater freedom.

The subsequent twinning of the pairs and stranding of the cable are, as mentioned, each responsible for a proportion of the breaks; to overcome them it is necessary to have the bobbins free from all superfluous friction, and thereby reduce the strain upon the wire.

An opportunity was recently afforded the writer of watching the manufacture of an experimental length of 100-pair cable, the size of the conductors being 20 mils, or 6½ lbs. to the mile (a very considerable decrease on anything previously attempted in England). The number of times the copper broke during the various operations was 74, the total length of wire being 69,200 yards, but the opinion was expressed that after a little experience with this thinner wire, the breakages might be considerably lessened. Provided that when a conductor severs it is thoroughly well jointed (preferably, perhaps, by being electrically welded) there is no reason to anticipate future trouble on this score. Many joints thus made have been examined and found to be quite satisfactory and strong, and when filed up almost undetectable.

An efficient method of jointing is welcome when one remembers that connections have come to light in the past which expressed mildly, left something to be desired.

Apropos of the operation of electrically uniting the conductors, a brief reference to a piece of apparatus known as the "Prescot" welder may with interest be introduced, since at one cable factory the welding progress is exclusively employed with the Company's cables.

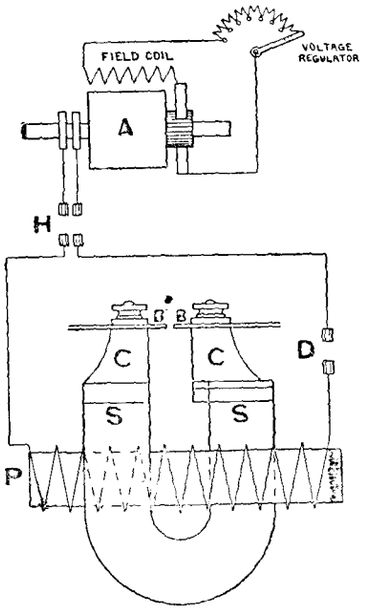


FIG. 10.

The principle involved in this method of causing two metals to adhere to one another in a thoroughly sound mechanical way is to raise to a high temperature the surfaces to be joined—the degree of heat varies with different metals—by means of a powerful current, when fusion takes place, and then under pressure applied at the junction the metals are forced together, the *modus operandi* being somewhat analagous to the less scientific procedure of the smith who heats his ends in a fire and then hammers them together.

The system adopted in constructing this type of welder can be seen by reference to Fig. 10.

An alternating current generator (A) is connected through two switches (H) and (D) to the primary winding (P) of a transformer.

The secondary winding of this transformer consists of a single convolution (S, S) of large sectional area, and terminates externally in two massive clamps (C, C) which grip the two conductors which it is required to weld together. When the switches are closed the alternator supplies current of moderate ampereage at a pressure of, say, 200 volts to the primary circuit, which is transformed by electro-magnetic induction into a current of great strength but low voltage in the secondary coil, and the heavy current so produced flows across the junction of the two conductors (B, B) to be welded. As practically the whole of the resistance of the secondary circuit is located at the ends (B, B), all the heat is developed at these parts, which is exactly where it is required. After a few seconds the metal begins to flow and the rods become united; at this stage the

current is switched off at (D). A slight bulge takes place at the joint, which can be trimmed down with a file or emery wheel.

Fig. 11 illustrates a machine designed for welding steel tapes such as the Company frequently specify for armouring cables needed for subaqueous work. The roller can be seen which travels gradually forward and imparts a moderate pressure on the extremities of the tapes, and forces them together at the moment of melting.

These two instances by no means exhaust the capabilities of these welders, work of a much heavier and different character being possible. Their further consideration is, however, outside the scope of the subject.

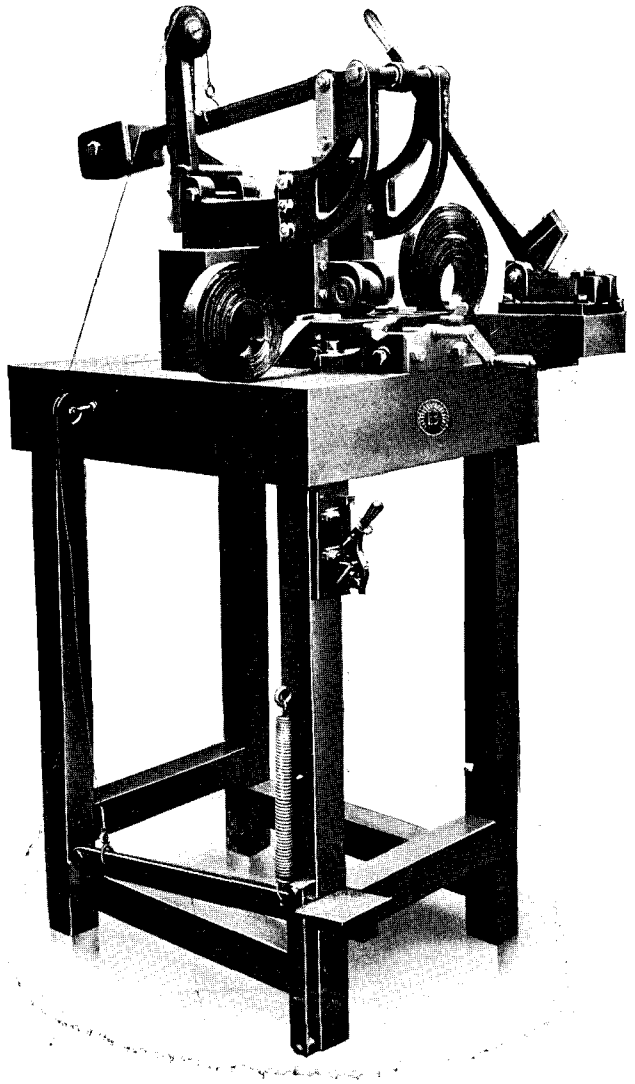


FIG. 11.

The introduction of 10-lb. copper has enabled manufacturers to give us 800 pairs and yet adhere to our maximum diameter.

A suggestion was made some little time ago, that hard-drawn copper might be suitable for use in building dry-core cables, as, on account of its high tensile strength, a very small gauge wire would withstand the strain in manufacture.

Upon investigating the matter it was pointed out that an attempt in this direction had previously been made, but with very little success, the "springiness" of the wire rendering it quite unmanageable. Directly the machine stopped it had a tendency to fly out of its paper covering.

(2) Leaving the diameter of the cable to the discretion of the manufacturers, within a defined limit, appears to be an innovation of the right character, they naturally being anxious to enclose the cable in as small a lead sheath as possible; on the other hand, the Company's interests, which are also in the direction of space economy, are safeguarded by virtue of the capacity test which is required. To obtain this it is impossible to crush the core excessively, and this serves a useful purpose in assuring a free passage for dry air. A further advantage is gained by this, as it provides a basis for stipulating a fixed diameter, should one at any time be decided upon.

(3) It is now the usual practice to order cable with two lappings of paper over the core and the abolition of the "skeleton" braiding would seem to be right from whatever aspect it is regarded. Electrically, it tends to prevent wires coming in contact with the lead, although it may be asserted that any bare place on the conductors would be better shown up than concealed; financially it is good, as the paper lapping is considerably cheaper, and from the point of view of celerity of manufacture and consequent quick delivery will permit of no argument, the paper being lapped on at the time of laying up, whereas the braiding was a separate process, and a very slow one at that.

Fig. 12 depicts a group of braiding machines such as are used in braiding our rubber-covered aerial dry-core cables.

(4) With regard to the mutual or wire to wire capacity, which we require, it would seem judging by the figures which, generally speaking, are got, that the diameters as at present in force, render this condition fairly easy of accomplishment, and it may perhaps be anticipated that a gradual reduction will yet take place.

(5) In connection with the stipulating of how many pairs are to form each layer, it may be of interest to mention an instance of what may be described as a "freak" in cable construction. A length of cable of 400 pairs was ordered. When this was delivered to the district and opened for jointing, it was found to contain only 399 pairs at one end, and the proper number at the other. It was necessary to open the cable somewhere about the middle of the length, when the curious discovery was made that there were no less than 428 pairs. How this could possibly have occurred was naturally regarded as a mystery, but like many other apparently inexplicable matters, it was capable of a very simple solution. It was found that the suppliers, in order to save time and labour were, when possible, in the habit of laying up two different-sized cables with one loading of the stranding machine. To render the meaning more intelligible it will be better to describe what actually took place in this instance. The contractors had an order for a length of 300 pairs and also this one of 400 pairs; they therefore loaded up the machine with bobbins containing a sufficient length of twinned wires to complete the two lengths. By the terms of our specifications it so happens that every layer of a 300-pair cable contains a larger number of pairs than the corresponding layers of 400-pair cable, which provided the opportunity for economy.

SPECIFIED NUMBER OF PAIRS IN EACH LAYER

300 Pairs	400 Pairs.	Difference.
3	1	2
9	6	3
14	12	2
20	18	2
26	24	2
32	30	2
38	36	2
46	42	4
52	48	4
60	55	5
	61	
	67	
300	400	28

The above table will assist the explanation. The 300 pair was first proceeded with, the different layers consisting of the number of pairs shown. When this was completed the machine should have been stopped and, in order to comply with our specified number of pairs in the first ten layers of 400-pair cable, the attendant should have cut free the number of pairs given in the third column totalling 28 and started the machine up again under the altered conditions to strand up the 400 pairs.

Evidently in this case the man for some reason forgot to cut out the extra pairs, and the whole length was laid up as 300 pairs, which, with the two outside layers of 61 and 67 pairs respectively (brought into operation when the 300-pair cable was finished), would give a total of 428 pairs. Then presumably he discovered his mistake, and instead of acknowledging it he attempted to conceal the oversight by cutting away the extra pairs for a few

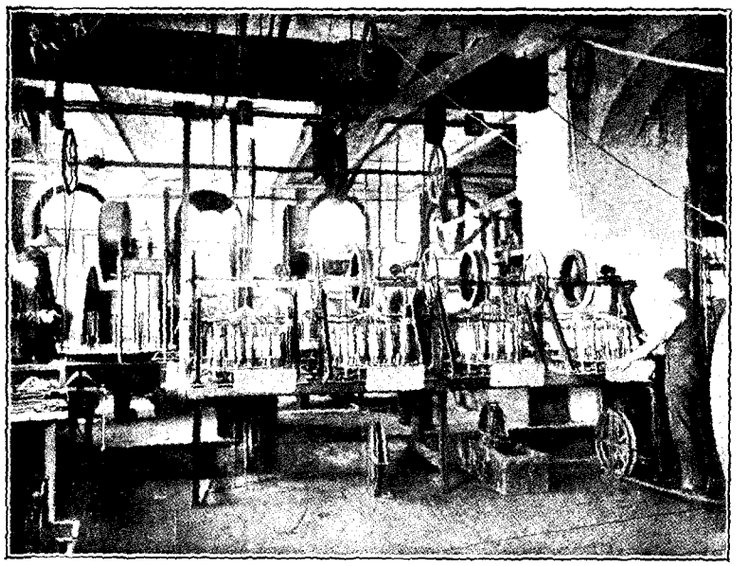


FIG. 12.

yards at each end, little thinking the cable would be cut at any intermediate place. Evidently in his haste, he cut away one pair too many at one end, hence the 399 pairs found there, and with the exception of these few yards at the ends the whole length contained 428 pairs. It will be acknowledged that the incident demonstrates considerable ingenuity on the part of the contractors in labour saving, although in this instance, owing to the error on the workman's part, it would be discounted by the fact that they had given away about half a hundredweight of copper.

ELECTRICAL TESTING AND INSPECTING.

The electrical testing of dry-core cables at factories consists in ascertaining their insulation resistance, electrostatic capacity and conductor resistance. For these purposes the usual methods are employed, viz., comparing the deflection obtained from the cable with those observed from a standard resistance and a condenser of known value respectively. A Wheatstone bridge is used for the measurement of copper resistance.

In taking the "constants" from the megohm and the condenser it is well to see that you really do get a deflection that is constant from day to day.

At one factory the very good practice prevails of taking an insulation constant through 10 megohms, the idea being that any high resistance which may in course of time creep into the battery circuit, which in this instance is composed of dry cells, may not bear so large a proportion to the standard as would be the case if only 1 megohm were used, in which case a considerably diminished deflection would result. With a battery of Leclanché or other "wet" cell such a contingency is not so likely to occur.

Broadly speaking, with the employment of D'Arsonval galvanometers (which is the almost invariable rule now) the only cause for inconstancy is alteration of the battery power. With a "Thomson mirror" there was always the probability of variations on account of the position of the controlling magnet not being always the same. This placed a buyer's representative at a disadvantage, as not being permanently at the works he was quite unable to arrive at any definite reason for an increased or decreased deflection.

A most necessary condition in taking wire to wire capacity measurements is that the battery be very highly insulated; an earth of quite imperfect character, such as the lid of the battery box resting against a chair or table, will give results greatly in excess of the true mutual capacity. Such being the case, it may safely be left to the suppliers to see that such an eventuality does not occur in their testroom. It is more a point which should receive attention when testing a cable on the drum as delivered from the manufacturers.

Fig. 13 illustrates an electrical testroom at a cable factory, from which leads are run to the drums of cable under test.

When the electrical tests are completed there remain quite a number of details of the mechanical construction of the cable which require investigation. The most important of these are:

The external diameter should be noted; the thickness of the sheathing at each end taken; the conductors gauged; the direction of the twist of the pairs and the layers examined; papers over core gauged for thickness; and it should be looked to that two lappings cover the core at all points—in other words a slight overlap should exist; also it should be ascertained if the centre bunch has a right-hand lay.

In the case of armoured cable, the iron wires and steel tapes must also be subjected to the usual gauging, and also to galvanising tests; these cables should always be electrically tested in water after 24 hours' immersion, or, failing this, an air pressure test taken, the former for preference.

When the cable on order is of the rubber-covered dry-core type, an air pressure test is taken before and after the external braiding is put on, that prior to braiding being taken with the cable under water, any pinhole in the rubber making itself apparant by a number of bubbles. In order to keep the interior of the cable dry, the usual precaution of passing the air through calcium chloride is observed.

Any additional data which can be obtained are always useful, such as the weight per foot; and, with composite cables, the lay-up of the cables should be recorded.

Cases have occurred where the cables have been enclosed in a pure lead sheathing instead of our specified alloy, this perhaps being due to some carelessness on the part of the "lead press" attendant, and may not come under the notice of any official. Therefore, it behoves the Company's representative to satisfy himself on this score. It is not always easy to determine this with great certainty from the appearance of the sheath. It will, however, be found that

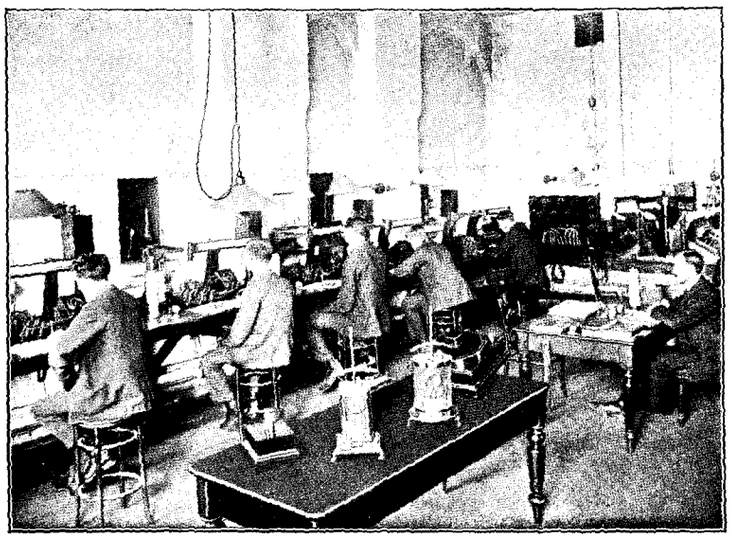


FIG. 13

pure lead, when struck with a knife or pliers, emits a dull sound, the presence of tin giving the blow a more metallic sound. Experience helps one considerably in judging this both by appearance and sound. Remembering the high price of tin, it will be understood that its inclusion or omission makes a vast difference in the value of the sheathing.

To measure the thickness of lead sheathing correctly, it should be done while in tubular form and with a micrometer gauge, in

which the surface of the plates between which the lead is held reduced to little more than a point in order to overcome the error due to the curve of the pipe, this of course being more noticeable on the smaller sizes. The necessity for gauging when in the form of a tube being that when a lead pipe is slit down and pressed out flat, owing to the extreme ductility of the material a considerable shrinkage takes place in its width, accompanied by an increased thickness, and measurements so taken are incorrect, the error being in favour of the manufacturer.

For their general assistance in the production of the illustrations, the writer is indebted to the following firms:—Messrs. The British Insulated & Helsby Cable Company, Siemen Bros., and the Western Electric Company, and tenders his sincere thanks to them for their courtesy in the matter.

BIRMINGHAM MIDLAND EXCHANGE.

A Brief Description of the Equipment, etc., of the National Telephone Company's New Premises in Hill Street, Birmingham.

BY T. CORNFOOT AND F. G. C. BALDWIN, A.M.I.E.E., *Electrician and Engineer, Birmingham.*

(*Concluded from p.* 230.)

A GOOD deal of thought and care are always given to the lay-out of the apparatus, and a reference to Fig. 5 will show that the best use has been made of the available light. It is sometimes a very difficult matter to arrange for good light in all parts of a room which contains frames stretching probably from one end of it to the other, and at the same time of such a height that they almost reach the ceiling. The registers are placed in a well-lighted position so that they may be read with ease. An indication of the main cable runs is given by the dotted lines in the figure. The multiple and answering jack cables rise to the switchroom by way of three specially constructed shafts, one at the main distributing frame side of the room, and two at the register rack side. The two last-mentioned shafts go up one on either side of the main staircase corridor, and are built through the floor occupied by the operators' quarters, and they are accessible on this floor by means of doors leading from the corridor. These shafts and the doors leading to them are shown on the operators' floor plan.

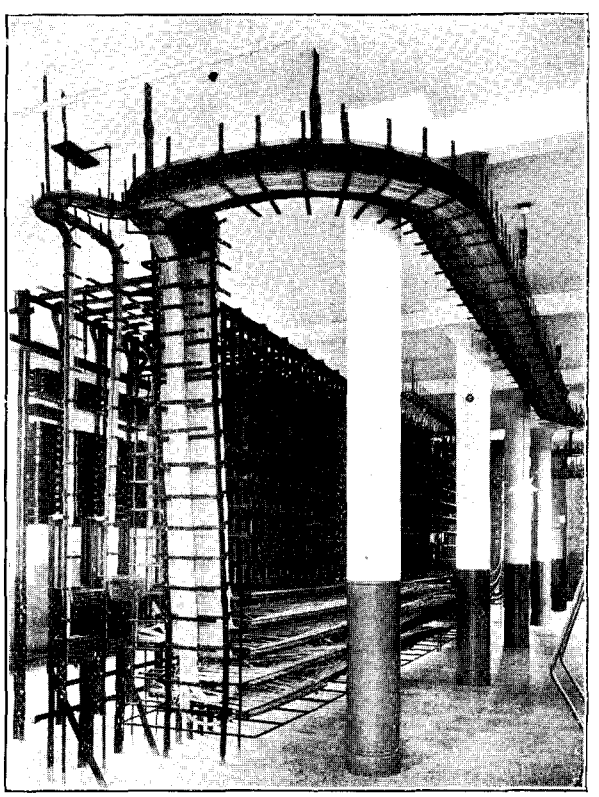


FIG. 6.—APPARATUS ROOM: INTERMEDIATE DISTRIBUTING FRAME SHOWING CABLES BETWEEN M.D.F. AND I.D.F.

A photograph is shown in Fig. 6 giving a view of the intermediate distributing frame, and this conveys a very good idea of the appearance of the cable racks and cable running throughout the exchange.

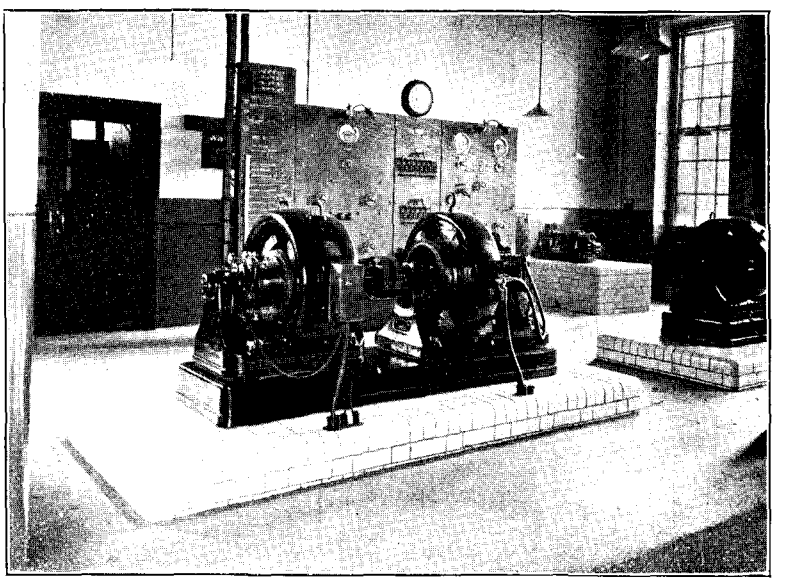


FIG. 7.—APPARATUS ROOM: POWER PLANT.

The small rack on the left situated at the end of this frame is fitted with five-point break jacks, and takes order wires, private lines and through junctions. The present capacity of the main frame is 15,000 lines on the vertical side and 15,600 on the horizontal side. The frame can be extended in a straight line to accommodate the ultimate capacity of the exchange.

The service testing room is situated in the rear of the apparatus room, and a two-position desk with one position equipped has been installed by the contractors.

The power plant presents no special feature, and its arrangement may be seen from the photograph (Fig. 7). The machines are not the ultimate ones required for the exchange when it is fully equipped, but the bases have been designed to take larger machines when the time comes to provide them. The motors on the present charging machines are 19½ horse-power, and are run from 440-volt direct current mains. The generators give 400 amperes at from 22 to 30 volts. Two 150-watt ringers are provided, one run from the 440-volt circuit and the other from the 22-volt battery.

The cells are of the usual chloride type, the tanks measuring 43 inches long, 20 inches broad and 23 inches deep. Nine positive plates are at present installed, and the tanks when fully equipped will take 24 positive plates.

The present nine-hour discharge rate of the battery is 170 amperes, and the one-hour discharge rate is 765 amperes.

The battery is capable of running the exchange for one and a half days with the estimated number of lines working at 1,112. When the ultimate number of plates is installed and the equipment is extended to accommodate 10,000 lines the battery will have capacity for one day.

Fig. 8 is a plan of the operators' floor, and shows the arrangement of the schoolroom. Reference has already been made as to how the special shafts were built through this floor. A photograph of the operators' sitting-room is also given in Fig. 9. It is not a room which is easily photographed, and probably does not appear at its best.

Fig. 10 is a plan of the switchroom, and is self-explanatory. There are 34 "A" positions equipped at present, and fourteen "B" positions. The number of "A" positions which can be got into the existing room is 56, and the number of "B" positions 27. When

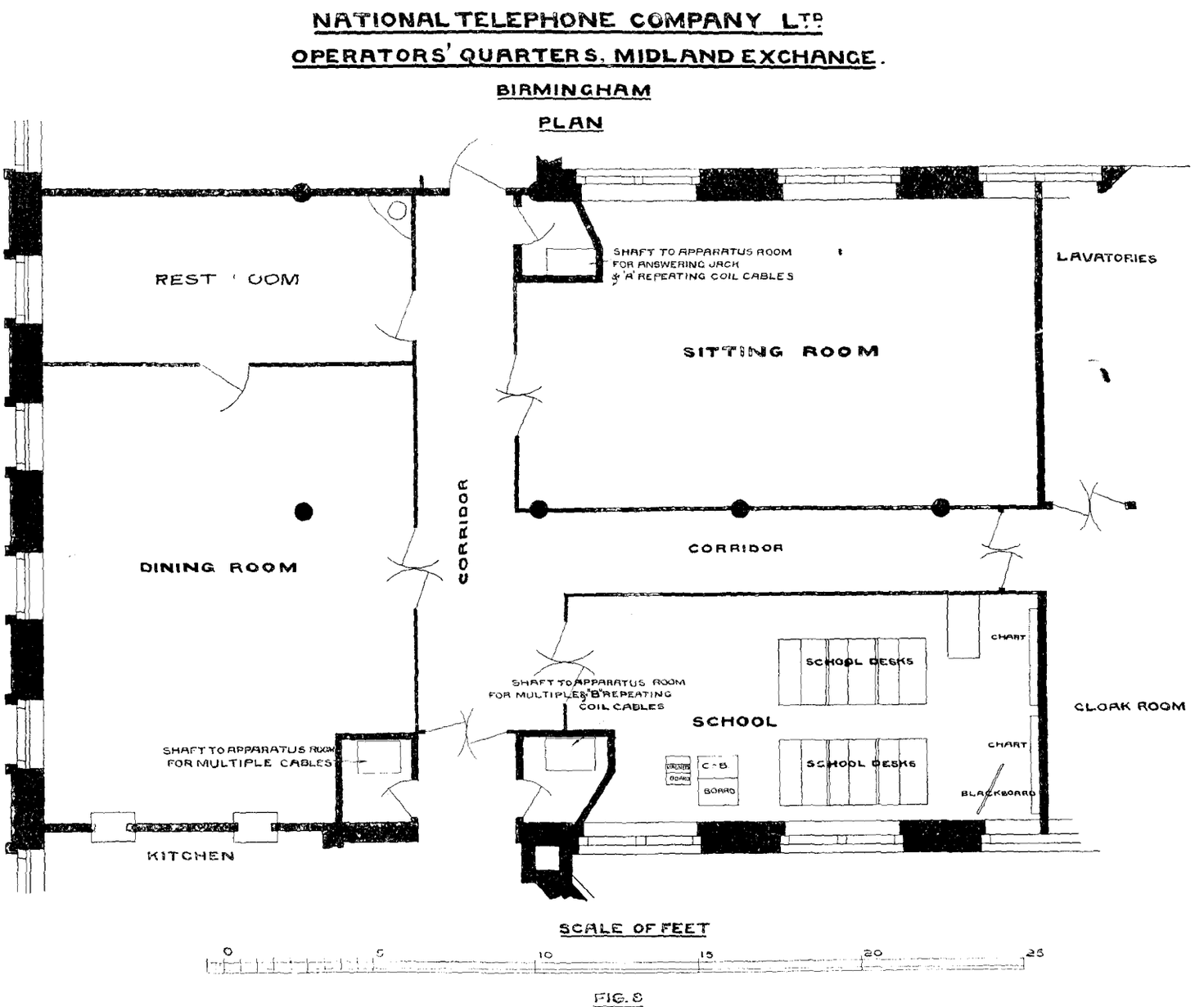


FIG. 8

the building is extended a total of 91 "A" positions and 42 "B" positions can be installed. The subscribers' multiple field has a capacity for 14,400 lines, with a present equipment of 3,300 lines. The sections have eight panels, the complete multiple occurring every nine panels on the subscribers' sections and every six panels on the junction sections. The outgoing junctions are multipled every six panels. There are 80 lines equipped per "A" position at present, and the junction positions are designed to take 27 junctions.

Fig. 11 is a photograph of the switchbroom taken a few days before the equipment was brought into use.

The exchange described in this article is the first of the Company's exchanges to be fitted with two multiple jacks per party line, and a brief description of the system may be of interest. Two jacks are provided per multiple for each two, four, ten or twenty-party lines, but only one answering jack and calling lamp. The multiple jacks are wired to the main and intermediate frames in the usual manner, and the party line is cross-connected to one of the multiple equipments and to the selected calling equipment at the main and intermediate frames respectively. The second multiple equipment is cross-connected to the calling equipment at the intermediate frame, but the lines are reversed when cross-connecting at the horizontal side. The operator will, therefore, with the same key on one multiple jack ring over the "B" line and on the other over the "A" line. A diagram of this arrangement can be seen in Fig. 12.

Fig. 13 shows the arrangement on the calling equipment. The top strip of local jacks only in a panel should be used for party lines, if these provide sufficient capacity. The designation strip will then replace the jack spacing strip usually fitted immediately above the top jack strip. These designation strips are fitted above each strip of answering jacks for two, four, ten or twenty-party lines. The number plate at the right-hand side of the answering jack and the number plate in the designation strip above the jack are used to indicate the subscribers' numbers.

The Company's standard opal codes, Nos. 9, 10, 11, 12, are used for two-party line calling lamps, the code X referring to the subscriber whose number is at the side of the jack, and the code Y to the subscriber whose number is above the jack. Opal codes 13, 14, 15 are used for four, ten and twenty-party line calling lamps, and the operator must refer to a list for the facilities to which the subscribers are entitled. Two-party line subscribers' numbers can be distributed over the multiple field, as it is not necessary to distinguish two-party subscribers, and the calling equipment may

FIG. 9.

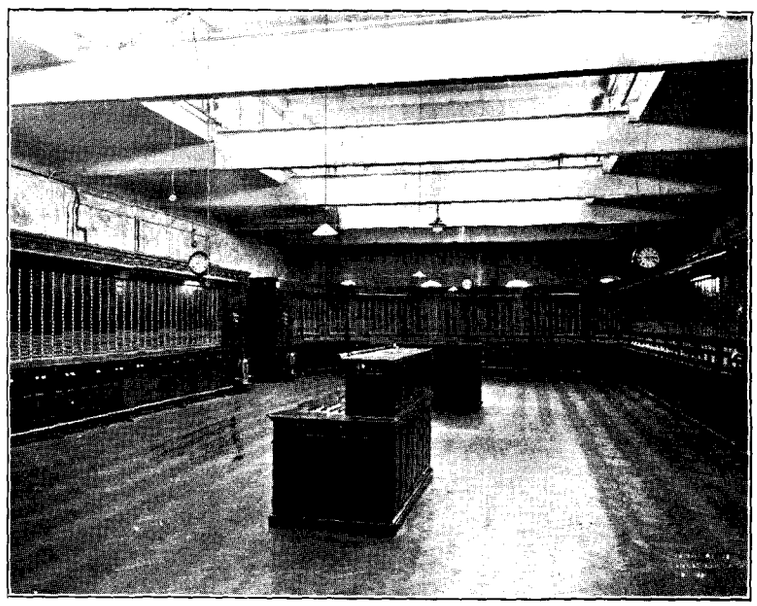


FIG. 11.—MIDLAND EXCHANGE SWITCHROOM: GENERAL VIEW.

be distributed round the board, while for four, ten and twenty-party lines groups of multiple numbers must be reserved, and the calling equipments should, as far as possible, be on one position.

The letters Y1, Y2, Y3, etc., must be used for subscribers on four, ten or twenty-party lines working on each multiple jack, thus notifying the operator that code ringing is necessary, Y1 denoting one ring, Y2 two rings, etc.

The advantages of the system for two-party lines are as follows:—

1. Simplicity in ringing.
2. Simple numbers.
3. Number changing reduced. A subscriber may

NATIONAL TELEPHONE COMPANY LTD
SWITCH ROOM, MIDLAND EXCHANGE, BIRMINGHAM.

PLAN

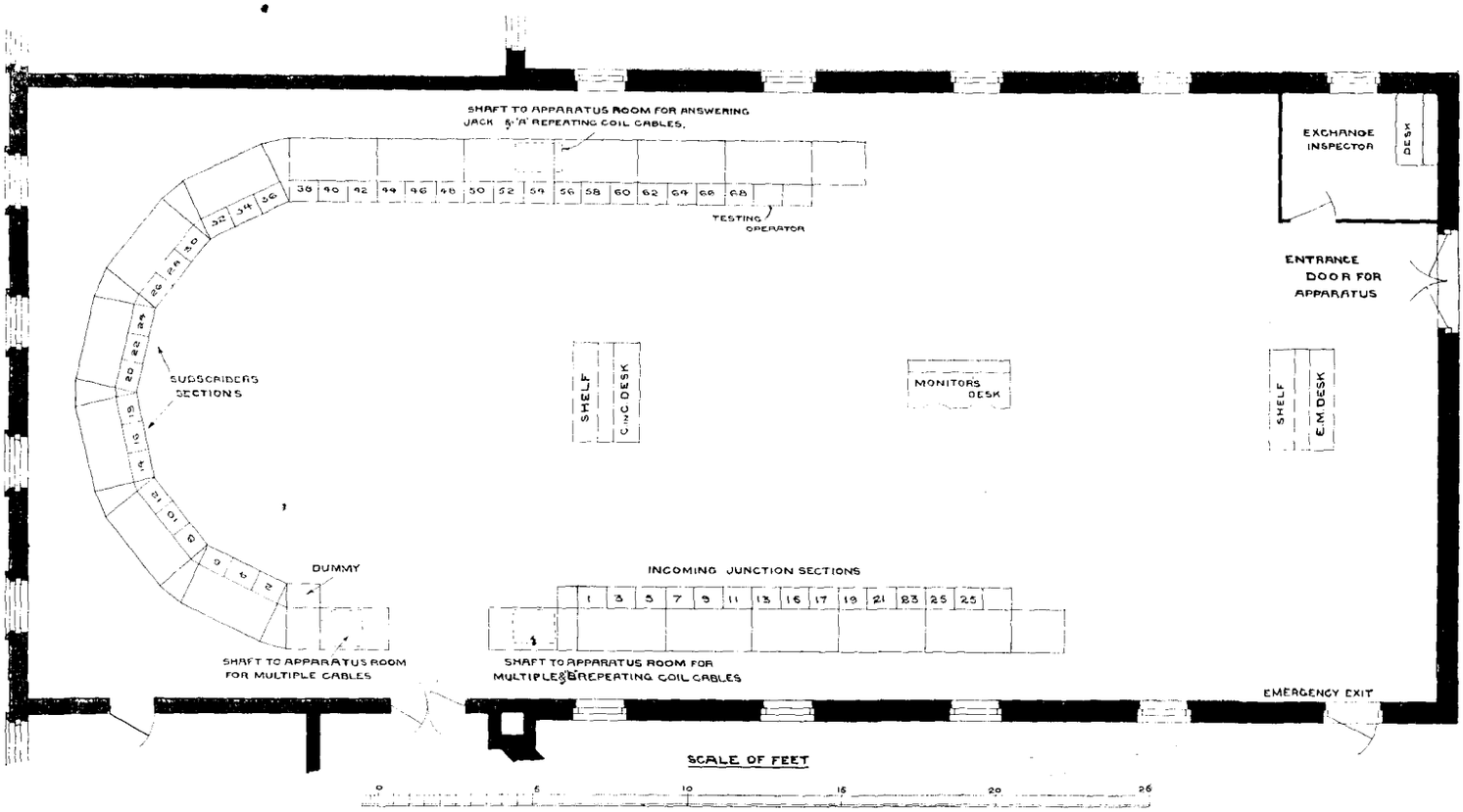


FIG. 10

change his class of service, place of business or residence within the exchange area and still retain the same number. On Fig. 13 consecutive numbers are shown, but this is not essential.

MULTIPLE PARTY LINE WORKING, TWO JACKS PER LINE
WIRING DIAGRAM

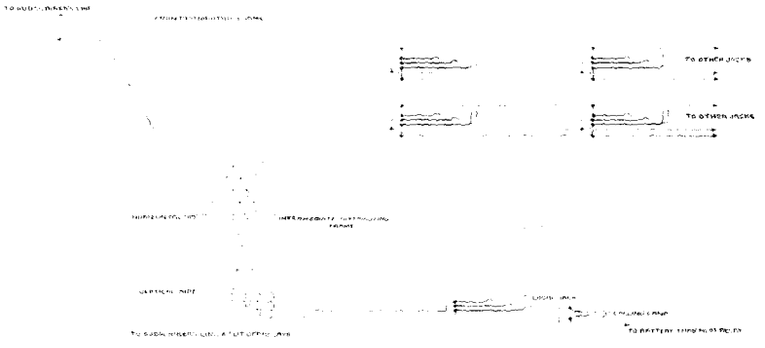


FIG. 12.

4. More efficient use of line plant. Subscribers can be re-grouped when desirable without alteration of number, and a new subscriber can take the place of a ceased subscriber at once instead of the line remaining spare for some months.

Of the above advantages No. 1, and to a small extent No. 2, apply to four-party lines.

PARTY LINE WORKING, TWO MULTIPLE JACKS PER LINE.
METHOD OF NUMBERING ON ANSWERING EQUIPMENT FOR 2, 4 & 10 PARTY LINES

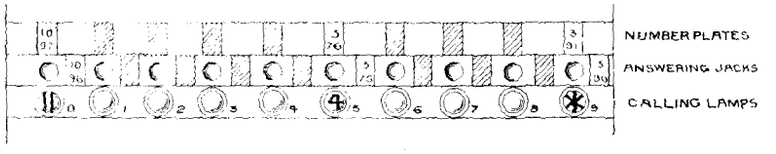


FIG. 13

The writers would like to take this opportunity of placing on record the very good work done by all the members of the staff concerned in the opening of the new exchange and in the successful transfer which has been accomplished.

CHESTER: ANCIENT AND MODERN.

WITH reference to the article on this subject which appeared in the February issue of the JOURNAL, the following letter has been received by the President of the National Telephone Company from the Royal Commission on Historical Monuments:—

"Dear Sir,—The chairman (Lord Burghclere) desires me to inform you that the members of this Commission have read with interest the account of the recent discovery of a Roman wall on the National Telephone Company's property at Chester, which appears in the last number of the NATIONAL TELEPHONE JOURNAL.

"The attention of the Commission was, in the first instance, drawn to this discovery by Lord Balfour of Burleigh, and I am to add that, in the opinion of the Commission, the care with which the excavations seem to have been carried out is most admirable.—Yours faithfully,

"Feb. 18, 1909. GEORGE H. DUCKWORTH."

TELEPHONE WOMEN.

XXXV.—EDITH CHARLOTTE HINDLE.

MISS HINDLE became an Operator when she was only fourteen years of age, joining the Manningham Exchange, then a sub-exchange to Bradford. At that time, 1897, Manningham more than is the case to-day, was the residential part of the city. She looks back with some relief now to those troublous days, and has a vivid recollection of her difficulty in dealing with a number of her own sex who seemed at times to be somewhat unreasonable in their demands. When in 1904 the Bradford underground scheme was completed, the Manningham Exchange was closed, and Miss Hindle was one of the operators retained in the service and transferred,

EDITH CHARLOTTE HINDLE.

along with the subscribers, to the Bradford Exchange, where after three years' service, she was promoted to the position of Supervisor. Always an able and willing official, she was, after a very few weeks, appointed Clerk-in-Charge, succeeding Miss Ellwood, who left after having held the position for eight years. During the time Miss Hindle has been with the Company the number of subscribers has increased from 1,400 to over 3,700. She is very popular with her staff, is a thorough enthusiast at her work, and is ready at all times to take her part in social affairs. She is most apt in the handling of subscribers, is quite a past master in dealing with difficult ones, and is looking anxiously forward to the completion of the alterations to the operators' quarters when she hopes to see her staff more comfortably housed than at present.

XXXVI.—MARY E. WYLDE.

MISS WYLDE, the present Clerk-in-Charge of the Wolverhampton Exchange, the largest and most central in the North Midland district, entered the Company's service in 1890, when the exchange was situated at Powlett Street, the centre then being under the management of Mr. A. E. Cotterell. The exchange had 68 subscribers and six junctions communicating with Birmingham and Bilston direct only, the latter exchange having just been opened. To-day the exchange serves nearly 900 subscribers, and possesses some 63 junctions. She has since seen the opening of Wednesbury, Brierley Hill, Tipton, Stourbridge, Cradley, Cannock, Aldridge, Tettenhall, Hagley, Sedgley and Codsall neighbouring exchanges, practically representing the telephonic development of the Black Country. She has during this period served successively under

five district and three local managers. On the exchange outgrowing the small primitive conditions at Powlett Street, in 1898 (Mr. W. Johnston then being district manager), the exchange was moved to what were regarded as up-to-date new premises in Lichfield Street, when Miss Wylde was appointed Clerk-in-Charge, a position she has continuously occupied for a period of ten years. In 1905, under the district managership of Mr. Archer W. Smith, she saw the exchange moved to its present commodious quarters at Telephone House, North Street, Wolverhampton, and she has now under her charge in that exchange alone, one supervisor and twelve day operators.

MARY E. WYLDE.

In addition to taking a keen, loyal and faithful interest in her work, she has invariably retained the respect and esteem over this long period of service of those working under her, as well as the confidence of the subscribers by her general tact and consideration. She is a member of the local committee of the telephone society to whose work she has been a contributor, and on the committee of that society she represents the operators' interests. Outside the sphere of telephone duty, she has for many years taken an active interest in Sunday school and girls' friendly society work. She pleads guilty to being fond of cycling and reading.

MARRY A TELEPHONE GIRL.

"YOUNG man," said the telephone superintendent, "take my advice and marry a telephone girl if you have simply got to marry some one.

"Why? Well, there are all sorts of reasons. But in the first place, as well as secondly, thirdly and fourthly, she will have a good disposition. When you come home late for dinner or leave your pipe in the parlour or commit some other deadly sin, she may do a lot of thinking, but she won't say much, and you will have the laugh on all the other husbands of girls who are not properly trained.

"You see, a telephone girl learns first and foremost to let other persons do the talking. If she didn't the company would lose most of its subscribers inside of a month. She sits for hours at a time in front of a board covered with lights and switches, and plugs and administers constantly to the wants of a lot of folks who are absolutely itching for trouble.

"Did you ever hear a woman, for instance, get busy at the 'phone? First, she calls a number, usually in a voice that defies any combination of electricity and wires to transmit. Sometimes she gives the right number. Not always. It proves to be busy.

"'Call me, Central,' says the lady at the 'phone. Then she goes away, sits down in a chair and fusses. In a minute she is back at the wire again.

"'That number still busy?' she asks.

"She doesn't say what number. The Central has been working both hands and everything inside of her head meantime, but the lady doesn't care. Central ought to have remembered the number.

"'What number?' she screams. 'What number? Why, I just told you the number not a minute ago!' As a matter of fact she had forgotten herself. However, she finds it again, and is again informed that it is busy.

"'Well, hurry them up,' she says.

"Just like that. What do you suppose would happen to the Central if she hurried them up? How would the lady like to be hurried up? But the Central says she will do her best.

"'Wretched service!' remarks the lady as she sits down. In a minute more she is up again.

"'Central,' she fusses, 'can't you get me that number. I've been for the last half-hour trying to get it. Yes, of course that's the number. So busy talking to the girl next to her that she doesn't pay any attention. I know perfectly well that there is no reason on earth why I can't have that number. It's just pure perversity. What's that? Busy? Oh, that's perfect nonsense. You told me that before. It is? Well, you give me the manager.'

"The Central does not answer her back, which spoils half the fun, and almost before she knows it she is connected with the manager, who is put there to meet just such complaints. He investigates and finds that the number is still busy. He tells the lady as much.

"She believes the manager, but still blames the Central for not giving her the number in the first place. She is perfectly sure the wire was not busy when she first called.

"Well, young man, the Central has to sit and take that for hours at a time and say nothing but 'Busy, I'll call you,' and once in a while gets a chance to switch off on a few numbers.

"It's hard training them. More girls fail to make "centrals" than there are that succeed. It simply isn't in the nature of the sex, or any other sex, for that matter, to sit and take it from all sides and say nothing in return. But they learn, and when they have mastered it they never forget.

"So, if you've got to marry, pick out a telephone girl from preference."—*Detroit Free Press.*

TELEPHONE MANNERS.

The *Post Office Circular* of Dec. 8, 1908, counsels telephonists to avoid "uncouth and abrupt expressions."

William of Wykeham, in a ruder age,
Said very truly: Manners makyth Man.
We moderns, following faithfully the sage,
Exhibit such good manners as we can,
Yet some forget before the telephone
Their well-bred tact, their *suaviter in modo.*
Their chivalrous respect for sex is flown—
Dead as the dodo.

What—on their desk in their own proper place,
Or in a call-box, soundproof, snug and shady—
Is there in the transmitter's open face
Makes them forget they're talking to a lady?
They use—pretence of patience long is past—
Breathing out threats more worthy of barbarians,
Strange adjectives and parts of speech unclassed
By good grammarians.

Yet some there be—officials of the King—
Who seem to think that it were only human
Upon the other sex the change to ring,
And tell them bluntly: Manners makyth Woman.
Since 'tis more blest to give than to receive
Politeness, thus sweet-toned each operator
Shall murmur: "Line engaged, Sir, by your leave;
Please ring up later."

W. H. GUNSTON.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
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EXCHANGE NOMENCLATURE.

IN an article which we print in another column Mr. VALENTINE makes out a case for the shorter naming of exchanges, and draws attention to the unnecessary time wasted by operators in enunciating such names as Chorlton-cum-Hardy and Weston-super-Mare. His suggestion is that monosyllables should as far as possible be employed, and that the columns of the JOURNAL should be opened for full consideration of the subject. We gladly invite discussion, and, since we have been charged with prejudging a case before it was heard because we made an editorial comment on it, it is perhaps necessary to say that the following remarks are merely an expression of opinion.

So far as the naming of exchanges within a large urban area is concerned there is much to be said for Mr. VALENTINE'S proposal, at least for the adoption of short if not monosyllabic names. There the traffic is heavy, every second of time in the exchange is of value, the large majority of the calls are local, and the subscriber calling for "North" or "Royal" may naturally be supposed to require the "Royal" or "North" exchange in his own town and not anywhere else. Moreover, such titles as City, Bank, Docks, Park, Royal, North, etc., are sufficient to go round. We take it that the suggestion does not apply to self-contained exchanges in country towns; there the exchange must of necessity take the name of its local habitation. If that name be Ashby-de-la-Zouch or Buckland Monachorum, so much the worse for the last syllables of the name: they will probably be suppressed. This conversion of place names from the dignity of many syllables and historical suffixes to short and simple words is characteristic of a hurried age. The process has been consistently carried on by railway companies, and in the Midland time tables the full name of Ashby-de-la-Zouch does not once occur. Similarly Toller Porcorum becomes Toller, and Wyrardisbury is simplified to Wraysbury. At a far earlier period important towns such as Kingston-on-Hull and Aberbrothock, whilst officially so styled, were known in common usage as Hull and Arbroath.

There is a harmony and seeming fitness in the names of English villages, even in the quaintest, a historical association, a link of continuity with the past, which it seems a pity to disturb for reasons of doubtful expediency; but in the name of an exchange which has frequently to be pronounced by an operator dealing with over 200 calls in the busy hour there is every reason for legitimate brevity. An exchange in a parish in the suburbs of a large town may very properly be called ". . . North" or ". . . East" for it doubtless serves other parishes than that in which it is situate, but exchanges at Newton Abbot or Leighton Buzzard, for instance, for which only an occasional call is passed, must—to avoid confusion—bear their geographical appellation. Such exchanges should bear their full titles officially, but when expedient the second name might be dropped where no possibility of misunderstanding would arise. There is a distinct advantage in suitable geographical names for exchanges. "North" and "South," "East" and "West" are liable to be confounded one with the other, and the similarity of Zwei and Drei, Vier and Fünf in the Berlin exchanges (which are designated by numbers) leads to many operating errors. Quite recently, too, the New York Company has exchanged "38th Street" and "18th Street" for geographical names. The question requires careful consideration; it is needless to say that aids to brevity are of the utmost importance in telephone work, but the case is one where a judicious conservatism is not out of place.

VOLUME THREE COMPLETED.

THE present issue completes the third year of the JOURNAL'S life. As last year, we have again to remark that the flow of contributions "by the staff" is undiminished and the matter in hand, both in type and awaiting consideration, is greater than ever. The extent to which the articles are especially "for the staff," reference to the index will clearly show. There are few sides of our diversified telephone work which have not been touched on: transmission, exchange construction, cable work, operating, traffic, clerical work, accounting, contract work, private branch exchange construction and many others. We have kept our readers in touch with the principal events in the telephone world on the Continent, and have published occasional articles on American practice. Lighter topics have not been lost sight of, for even so serious a subject as telephony has its humorous side. The social proceedings, the promotions and transfers of the staff have been regularly recorded, and the columns of the JOURNAL have been open as heretofore for the discussion of ideas and making of suggestions. The portraits and biographies of telephone women have proved very popular, and a new feature has been added in the form of a series of articles on the Staff Transfer Association by a member of its Central Committee. The fact that the JOURNAL appears only monthly precludes the possibility of chronicling with any promptitude the proceedings of the Association, and editorial reference to the serious position of the construction staff which arose during the past year has been impossible owing to the inexpediency of discussing such matters whilst *sub judice*.

As we have already said we watch with sympathy the efforts of this important association and will assist it in all possible ways. We hope to continue the publication of articles containing hints and assistance to the staff in their own branches of work and keeping

them abreast of the progress made in other branches. During the past year we have been pleased to be able to publish communications from ex-members of the staff and others in Alexandria, Cairo and Aden (Arabia), and the circle of our readers now embraces every continent, the latest addition to it being in Rome, Madras, Antonken (China), Kyoto, Osaka, Mauritius, Port Elizabeth and Brisbane.

NOTICES.

THE portraits of Messrs. A. Watts, Harvey Lowe and J. W. Campion can now be obtained at 6*d.* each, and those of Messrs. G. H. Robertson, R. Shepherd and A. L. E. Drummond will shortly be ready.

Binding cases for Volume III at 1*s.* 6*d.* each are also obtainable on order.

FOREIGN INTELLIGENCE.

America (United States).—According to the return of the Census Bureau the number of telephones at the beginning of 1908 was 6,118,578. Of these 3,132,063 belong to the Bell Telephone Companies and 2,986,515 to the "Independent" Companies: 85,287 stations a large proportion of which were included in the latter figures were farmer's or rural telephones served through Bell exchanges. There were 15,527 exchanges in the States and 12,999,369 miles of wire at the date mentioned.

Austria.—From the annual statistics of the Austrian Postal Administration we learn that there exist 692 exchanges in Austria at the beginning of 1908, as against 675 the previous year, and 67,923 stations as against 58,558. The length of wire in kilometres was 306,898·73 (local lines) and 32,791 (trunk lines).

Belgium.—From the report to the Minister of Railways concerning the telegraphs and telephones in 1907 it appears that there were 28,946 subscribers (not stations) in Belgium at Dec. 31 of that year, of which 9,754 were in the Brussels group, 4,211 in the Antwerp group and 3,457 in the Liége group. The total number of exchanges was 196.

HIC ET UBIQUE.

A SEA captain, apparently hailing from the Highlands, stepped into a call office in an Ayrshire coast town and passed a trunk call. There being no reply he rang the exchange, and spake thus after the manner of the Highlanders in Black's novels: "She'll no have heard she wants his number."

IF "phone" is intolerable (says *Telephony*) how about the latest verbal invention of a reporter for the *New York Herald*? That estimable paper has allowed itself to be so far led astray as to come out in big type and say: "*Telephone Girls Like 'Phoniste'*; think it sounds dignified and would look real nice on a card."

Here is one of the interviews with ardent admirers of the invention:

"'Telephone operator' is all right if you say it quick, but it's slow, and 'operator' means anything from a shirt-waist hand to John D. 'Hello Gell' has been frayed ever since the newspapers began printing romances about millionaires and the belle of the switchboard, and I won't have any man within a mile call me 'Switch' or twitter lines for ten, twen', thirt' melodrama. 'Central' signifies nothing, since so many of us have boards of our own in offices and stores.

"'Phoniste, pianiste, artiste! Well, I'm for it, and one of these days you will see me with an engraved card with the new handle right down in the left-hand corner. It's simple, its dignified, it's swell. "Wealthy Wooer Weds Pretty Phoniste' is certainly more to the proper than 'Rich Scion Marries Hello Bride.'"

We are in a position to explain that "waist" is American for blouse; therefore a shirt-waist must be a shirtiform blouse, if we may so express it. But what "twittering lines for a twen', thirt' melodrama" may be we have not the remotest conception.

THE latest application of the telephone in the States is to the barber's saloon. The busy man who goes out for a shave, we are told, can leave word with his clerk to ring him up at the barber's, "Chair No. —," and then undergo the lengthy operation with the assurance that he is accessible. When an Englishman is overweary of having American "hustle" cast in his face, he is apt to reply that the American certainly saves some time, and acquires indigestion, by a quick lunch in fifteen minutes, but then he usually spends an hour in elaborate mysteries at the barber's. The charge seems to have received some confirmation.

ABOUT a year ago a telephone cable was successfully laid across Lake Constance—not a matter of a great many miles. From this achievement a reporter in the *St. Louis Times* is moved to chronicle the success of (entirely imaginary) experiments in submarine telephony from Genoa to Buenos Ayres. With impressive calmness he refuses to wonder at this feat and, to crown all, finishes with the words "The marvel is that the thing was not done sooner!"

A JERSEY INCIDENT.

THE District Manager writes:—"An incident occurred here which may be sufficiently amusing to find a corner in our JOURNAL.

"In this island we have a large establishment belonging to the famous order of Jesuits and in which many holy fathers and students reside. In the beautiful grounds of the said establishment we have, thanks to kindliness of the Rev. Pere Ministre, several of our poles. An additional pole was recently being erected, and the foreman requiring a heavy rope which was lying on the somewhat muddy ground, hailed one of his men (who being middle-aged is known to the members of the gang as Father) as follows:—'Father, bring that rope round here!' Thereupon the esteemed and reverend Father Superior of the Order (who had been watching our men's operations) without a moment's hesitation, picked up the dirty rope put it on his shoulder over his cassock, and carried it to the foreman, who needless to say was extremely surprised and apologised amply to the good father, who however was highly amused at the *contretemps* and replied that he was 'Father.'

"The foreman inwardly noted that when working in that vicinity again the 'Father' of the gang must be called by the name his birthright gave him, although so accustomed is he to his nick-name that he would probably have to be called twice before he would realise that it would be he that was wanted."

AWARDS FOR INVENTIONS, SUGGESTIONS, ETC.

THE following awards have recently been made by the Company on the recommendation of the Education Committee:—

	£	s.	d.
J. W. Banks, Head Office, template for stamping number discs ..	2	2	0
Miss B. Wood, London, board for marking number pegs	2	2	0
J. H. Hall, Bradford, works order cost slips	2	2	0
F. J. Early, Dublin, correspondence and telephonic replies	2	2	0
C. Anderson, Liverpool, labour slates	0	10	0
E. J. Holliday, Liverpool, labour slates	0	10	0
J. W. Fairhead, Norwich, form to provide for payment of allowances to caretakers	2	2	0
H. H. Thomson, Head Office, forms for showing junction fees chargeable in each area	2	2	0
J. W. Wheeler, Head Office, grant for obtaining bronze medal ..	3	0	0

ARE OPERATORS MERE MACHINES?*

BY BERTHA WILLIAMS, *Monitor, Cardiff.*

ARE operators mere machines? Well at any rate they are part of the vast machinery of the telephone service. Operators work, or should work, together like the parts of a machine and according as they do their work, well or otherwise, so will the output of the machine (the results obtained) be satisfactory or unsatisfactory. I shall therefore try to adduce a few arguments on each side, and leave it to the meeting to decide the question.

In the first place, then, what is a machine? I find several definitions in the dictionary, of which the two following are samples:—

"Any artificial means or contrivance; any instrument for the conversion of motion."

* Paper read before the Cardiff Operators' Telephone Society.

"One who can do only what he is told, or who acts without purpose, or in a mechanical manner."

I think we can pass over the first of these definitions with just a few remarks. "Any artificial means or contrivance; any instrument for the conversion of motion"—that sounds too crude and mechanical altogether, although it is perhaps the most generally accepted meaning of the word "machine"; but for me to try and draw any comparison between a telephone operator and an artificial means or contrivance, would, I fear, not be safe or advisable in the presence of so many members of the switchroom staff.

The second definition, "one who can do only what he is told, one who acts without purpose or in a mechanical manner," does not sound quite so bad, and I shall venture a few remarks in order to try and show you that there are some senses in which it *can* be applied to the telephone operator.

The operator should act like a machine with regard to accuracy and speed. To be likened to a machine implies reliability and the full assurance of being able to do a certain amount of work in a given time, and if some operators could do their work in a more machine-like manner perhaps the operating rules would be better carried out.

If the operator carries out the operating rules, adheres to the letter of the law—in other words, acts in a mechanical manner—she is safe; she is *doing* what she is told. What more can be expected? Her employers have in her a machine on which they can depend. She will always act correctly, speak correctly, I shall not say think correctly, because she is not supposed to think; she is not paid to think. She is a machine. She must not mind when subscribers pass rude and insulting remarks. She must switch them on to the exchange manager, clerk-in-charge, or supervisor, as the case may be, and go on with her work as though nothing had happened.

Many subscribers imagine that the very work—operating—in itself would make the operator inclined to be mechanical. I remember a friend once saying to me that he could not see how the operator could be any different in her work. She does the same thing time after time and day after day. How then can she be otherwise than mechanical? And I believe this view is held by many a subscriber, and this very fact in itself should make an operator just the reverse.

We have heard the switchroom described as the "hub" of the service, and it is a good description. The "hub" is the central part of a wheel from which all the spokes radiate, and the exchange is surely the central part of a system from which subscribers' lines radiate, and each member of the switchroom staff is a part of the machine doing her own work.

All work requires some thought, and it would be a sorry thing if an operator did everything without thinking over it. Instead of fewer mistakes, we should have more than we have at present. Your machine-like operator never makes mistakes, she takes her place at the switchboard exactly at the appointed time, she handles the traffic with the reliability of a machine, she requires little supervision, she only fails to do her duty when she is overloaded (and of course we all know that since team work has been introduced in the Cardiff Exchange, no operator *is* over-loaded—there is always one operator or other in her team to help the busy position). Immediately she receives the calling signal she takes the answering plug, plugs in, repeats the usual question, tests the called subscriber's line and, if disengaged, plugs in, rings and goes out of circuit. Should a subscriber pass the time of day to her she takes no notice, but by her mechanical actions shows him plainly that she is there to do only what she is told. In short she *is* a machine. She will record all calls with the accuracy of a national cash register, not because her failure to do so means loss of money to her employers, but because it is part of her allotted duties.

So much for the operator who carried out her duties in a mechanical manner, but though it is well to have some of these qualities which I have just mentioned, I think you will agree with me that all good and efficient operators are something more than that. I have said that she should be machine-like with regard to speed and accuracy, but I think that these are the only two points in which there should be any similarity between an operator and a machine. It is that little word "mere" which puts a different aspect on it. No one should be content to be a mere machine, or in other words only a machine. She should try to remember that very good old saying, "If a thing is worth doing, it is worth doing well," which applies quite as much to operators as anyone else. No machine can exercise discretion, or be cautious, or be resourceful, or take an interest in its work, or read the TELEPHONE JOURNAL in which so many useful hints can be found, or attend the meetings of the telephone society, where such advantages have been gained and points brought to light in exchanging views and opinions on matters connected with our work.

No machine can smooth over difficulties when occasions arise, or study the interests of those for whom it works. By a polite and courteous manner and a cheery voice the operator does much towards making the subscriber a friend of the Company. She helps to convince him that it is her wish and endeavour to give him satisfaction. To some this courtesy and politeness comes naturally, but in others the humdrum mechanical voice and manner, the tone in which they repeat "Number, please?" and "Number engaged" cannot tend to convince the subscriber that at the other end of his wire there is an intelligent operator whose wish it is to get for him the best value out of the telephone service. If an operator is at all inclined towards the mechanical tone of voice, she should try to get out of it; she should, if she wishes to improve herself and her operating, cultivate a cheerful voice and a polite manner. In fact, she *must* get out of it, for otherwise the very monotony of her work, the sameness of the phrases "Number, please?" etc., which she has to repeat hour after hour and day after day will make her more mechanical than ever.

By the exercise of common sense and discretion, the operator will prove herself to be of real value. Some of you will think no doubt, "How am I to exercise discretion? I am not allowed to talk; how am I to know how far this discretion is to go?" Well, it is perhaps hard to draw the line, but that is just where you will show that you are not a mere machine, and use your own discretion within reasonable limits.

When an operator is sent to an outside or sub-exchange she has an opportunity of showing what is in her; she is her own supervisor; she is "monarch of all she surveys." She then undoubtedly has increased responsibility, and, although most girls perhaps would prefer to stay in the Central Exchange where most of the responsibility falls on the supervisor, still the experience which they gain when thrown on their own resources brings out the best that is in them.

The operators of to-day are treated very differently from the manner in which they were when I first entered the service of The National Telephone Company. An operator was plainly shown that as long as she went the usual round of calls through the day nothing more was expected of her. What was this but a mere machine? This was before the days of telephone societies, but now things have altered, and much has been done and is being done to stimulate operators' interests, and to encourage them to do their best, and these efforts of the Company have been much appreciated and have had a good effect on the service. The operators have striven to do their best, not only for the sake of the increase in salary which they know they get when satisfactory, but because they take a lively interest in the work and in the progress of the Company. Of course, I do not say for a moment that the improvement in the service is entirely due to the operators' efforts. New appliances have come out; new systems of operating have been adopted—team work, for example. The public are gradually being educated to the proper use of the telephone, and have learned that it is essential that they should answer promptly and ring off when finished, otherwise they would be "engaged" to those who may want them, and that will possibly mean loss of money to themselves; and the British public do not like losing money. All these things, all these wheels in the great machinery of the Telephone Company have conduced to the good of the service, and not the least of these wheels is the operator who takes a lively interest in her work.

The very word "operator" means one who operates or one who controls the machine; therefore, an operator must *not* be a machine. My advice to you all is not to be content with being *mere* machines, and if one is at all inclined that way she should try and rouse herself from it, not only with regard to telephony, but in anything else she undertakes

A POPULAR VIEW OF THE ELECTRON THEORY.

BY J. R. MILNES, *Engineer-in-Chief's Department.*

(*Concluded from page 216.*)

V.

To proceed further it will be seen that when we use a magnetic body, such as iron, placed in an electro-magnet we are in reality requisitioning the molecular current existing in the atoms of the iron to enhance the effect produced by the external current in the wire. The production of the external field causes the atoms to set themselves with their axes parallel to one another, and as soon as this is done an electron current flows in the same direction as the magnetising current around the body.

Fig. 2 shows more clearly the effect referred to, and it should be noted that whilst the atoms in the interior of the body neutralise one another, the total possible magnetic flow is measured by the number of electrons travelling around the surface of the conductor on the free sides of the atoms. It has been calculated that the total electron current flowing round a centimetre cube of iron, that

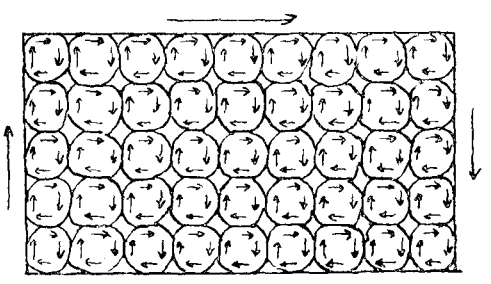

FIG. 2.

Section of magnetised iron showing how orientation of atoms enables electron flow to be utilised. Small arrows denote direction of orbital path of electrons. Large arrows show direction of path of electrons on outside of iron *not* cancelled by equal and opposite forces due to adjacent atoms as in the body of the iron. This summation of portions of electron current on surface of iron produces the phenomenon of magnetisation.

is to say, its intensity of magnetisation, is equivalent to a flow of 25,000 amperes. It is well to remember here that the heating of a conductor is caused by the loss of energy due to collisions between electrons and atoms. In the case in point the electron current used is merely revolving in its free orbit around the atoms. It, therefore, has no "resistance" offered to its flow by collisions, otherwise we should expect the mass of iron to immediately "burn out."

The great importance of being able to tap an electron current in this manner is self-evident if we consider a dynamo having to be built without iron or some magnetic metal. It also draws attention towards the vast stores of energy available in atoms generally could these be tapped.

Electro-Magnetic Induction.—It is easier to start an electron in empty space than when it is flowing in the same direction as other electrons. This is due to the energy of position which causes two wires carrying current to attract one another. The force exerted is directly proportional to the velocity of the electron flow, and therefore to the magnetic field.

In consequence when a flow of current (inducing a magnetic field) is started in a fixed circuit adjacent to another circuit with current flowing in the same direction the flow in the latter circuit is retarded by the magnetic field due to the current, and the phenomena of induction is experienced.

* * * * *

I had intended at the commencement of this series of articles to survey briefly the whole field of electrical investigation in relation to the electron theory, but, although I have given what I can only call the merest notes on the subjects touched on, I have found that not only would further treatment of the subject involve assuming a fairly complete elementary knowledge of the whole range of physics on the part of readers, but would also necessitate trespassing far too much on the space and indulgence of the editing committee of a "journal devoted to telephony." I have hoped, however, that the articles have not been without interest to those of the staff who are interested in the wider application of the fascinating subject of electricity. I will therefore now only very briefly touch on the broad outlines of some of the remaining branches before concluding.

Radiation and Light.—If we imagine an electron oscillating backwards and forwards in a vertical path, it will be seen that two pulses travelling in the ether will emanate from the motion, in the same plane but at right angles to one another, the inductive and the electro-magnetic. These pulses constitute the two phases of electro-magnetic waves and light. This illustration comes to the same thing as viewing an atom with the orbital plane of one of its electrons at right angles to the observer; plane polarised electro-magnetic waves or light being the resultant. If the plane of the orbit is parallel to the observer circularly polarised light results, that is to say, the wave consists of a spiral "twirl" instead of a sinewave. The sum total of the various pulses produces the spectrum. Where an element is in a condition of vapour with a source of light behind it, such as in the solar atmosphere, the series of electrons corresponding to those in the constitution of the atom "vibrate" at the same rate as the corresponding electrons producing the spectrum and give rise to interference, producing the Fraunhöfer dark lines and showing the presence of the atom with which they are associated in the solar atmosphere.

Cathode Rays.—The cathode rays consist of a stream of electrons projected from the cathode in a vacuum tube at about one-tenth the velocity of light.

The Röntgen rays, produced by the impinging of cathode rays on a suitable substance consist of "kink" electro-magnetic waves (the top half of an abrupt sinusoidal wave only) produced by the jarring of the atoms due to their terrific bombardment by these electrons.

Radio Activity.—Under this heading we are probably dealing with the most unlooked-for result of scientific investigation. The element known as radium possesses the extraordinary property of disintegrating. For a seemingly indestructible chemical atom to break up into totally different elements as is the case in radium, is indeed of sufficient moment to attract attention. Rutherford says "There can be no doubt that in the radio-active elements we are witnessing the spontaneous transformation of matter, and that the different products which arise mark the stages as halting places in the process of transformation, where the atoms are able to exist for a short time before again breaking up into new systems."

In detail the radium atom, which by the way, is supposed to have originally "descended" from uranium, goes through eight observed transformations.

The first break-up of the atom results in the discharge of a positively charged helium atom at a tremendous velocity. The remaining portion of the radium atom is a *gas* called radium emanation. The second break-up consists in the projection of another helium atom, what is left being no longer a gas but a *solid* called radium A. Radium A in the third stage shoots off another—the third—helium atom being transformed into radium B. Radium B rapidly changes to radium C without any evolution of gas, and is probably a rearrangementof the atomic structure only. Radium C decomposes to radium D, giving off another atom of helium, an electron and Röntgen X-rays, finally radium D disintegrates through radium E with evolution of an electron and X-rays to the element radium F or pollonium, and finally after a long lapse of time and possible intermediate minor changes becomes the well known metal lead. This transformation, with evolution o· electrons, or cathode rays, gives evidence of the greatest value towards the supposition that all matter consists ultimately of positive atoms and negative electrons, the varieties of elements with: heir different properties being merely due to the number and arrangement of the electrons around the positive atoms, and has revolutionised our ideas with regard to the constitution of matter.

The Positive Atom.—In comparatively recent investigations attempts have been made to isolate the positive atom.

It has been attempted to be proved that the specific charge of positive streams or canal rays is 10^4 indicating positive hydrogen atoms, or half that amount, pointing to a monovalent combination of 2 hydrogen atoms or $\frac{1}{2}$ helium atom. This theory has been enlarged on by Van der Brod who has attempted to build up a

periodic system from these ¼ helium atoms, or "alphads," as he calls them. In fact, if his theories will hold water, it would appear that hydrogen is the philosopher's long-sought protyl, and ¼ helium possibly an allotropic form of it.

General.—The actual number of electrons in an atom has yet to be answered. Campbell, however, in some recent researches has stated that there are 1,200 electrons in a radium atom. The hypothesis that the Fraunhöfer lines are caused by the electrons is most probably correct, but even if this is admitted we still have to deal with the dark portions of the spectrum infra red and ultra violet which may hold other electrons in their unexplored regions.

Kauffman says the electron mass may be entirely electro-magnetic. If a mass acquire energy E in any of its many forms that mass is increased by fraction E/V^2, where V = velocity of light. In other words, all energy has inertia. Stark has even gone so far as to say that there is an atom of energy, ½-millionth of an erg, and this energy is the exact quantity exemplified in the electrostatic energy of the electron.

I might quote pages of recent researches all adding their little to and extending the already vast sphere of the electron theory—but these unrelated experiments, apart from their intrinsic interest and value, would be, as I have said, far beyond the scope of this paper, and at this point I must ask the reader who is sufficiently interested to carry on his studies by reference to other and more detailed works on the subject.

In conclusion, I cannot do better than quote some interesting speculations from Fournier d'Albe's most interesting and valuable work *The Electron Theory* (pages 282-289), and to which book I cannot do better than recommend all those interested.

"The atom, with its detachable electrons, is sometimes compared to the solar system. The analogy is somewhat far-reaching and deserves to be pointed out, if only to assist the memory and the imagination.

"If the solar system is an atom on a large scale, the sun must be regarded as the positive nucleus, and the planets as the electrons. It is actually found that the sun has a positive charge, and the earth a negative charge. But these are comparatively infinitesimal, and do not perceptibly influence the force between them. In this point therefore, the analogy fails. On the other hand, the ratio of the masses is very instructive. That of Jupiter is about $\frac{1}{1000}$ of that of the sun, and approaches the mass of an electron in comparison with a hydrogen atom. The mass of the earth is $\frac{1}{324000}$ of that of the sun, and this ratio is nearly the same as that of an electron to the atoms of the heavy metals. We may say, therefore, that in the solar system we have examples of the various actual ratios of mass as between an electron and its positive nucleus, though in the case of atoms it is the atoms themselves, and not the electrons, which vary in mass.

"It may well be, however, that the sun's positive electric charge just balances the negative charges of the planets, in which case the solar system would represent a neutral atom of matter. If, under such circumstances, another neutral solar system were to approach ours sufficiently closely to entice Neptune from its allegiance to our own sun, we should have an illustration of two atoms combining and then separating with opposite charges, our solar system being positively charged, and the foreign system negatively having captured one "electron" Neptune from us. Thus we should represent, say, a mercury atom, and the foreign solar system, say, a chlorine atom.

"As matters stand, the solar systems of the visible universe do not seem to approach together so closely as to interfere with each other's planets. The visible universe thus represents a gas rather than a liquid or solid, except that portion called the Milky Way, which appears to have a consistency capable of giving it a metallic appearance if it could, by some magic means, be reduced to tangible dimensions.

"The visible stars number quite a thousand million. Now, the smallest object visible in a microscope contains at least a hundred million atoms. We may take it for granted, then, that the visible universe, whose outer edge is the Milky Way, if reduced in the same proportion that an electron bears to the earth, would resemble something rather like a human blood corpuscle, and would contain about the same number of atoms.

"A blood corpuscle is too small to observe individually its electric and magnetic properties, not to speak of examining the properties of its individual atoms and electrons. A large number of universes would have to be taken together, and the results would be average values. If we can imagine a giant of this new Brobdingnag endeavouring to arrive at some measurements of the masses, velocities, and electric charges of the stars and planets—'atoms' and 'electrons' he would call them he might very well find the same average value for each million of them which he might pick out at random. He might find that the ratio of the charge to the mass of each detachable planet was the same, and that the charge of each planet approached a standard value within the limits of his powers of measurement. He would naturally arrive at the same conclusion as we do with regard to the electrons, viz., that they are absolutely constant and equal bodies, constituting the physical units and vehicles of electricity.

"Further, our giant might be able to sort the various solar systems according to their masses, and establish certain 'chemical' affinities between systems of different mass. He might find that the masses, which he would call 'atomic weights,' showed a certain constancy, and a determining influence upon the affinity and chemical characteristics, and would thus be led to discover a large scale 'periodic law.' He might, by compression or chemical treatment, bring the solar systems closer together and enable a certain number of planets to roam at large among the fixed stars. He would thus have produced a 'conductor.' Finally, he might succeed in turning the ecliptics of the various solar systems into the same plane, and thus would produce a 'magnet' of stupendous magnitude.

"We thus see that much insight into molecular physics may be gained by considerations of astronomical phenomena happening on a much larger scale.

"The scale by which we must reduce the visible universe to get it down to microscopic dimensions is 10^{22} to 1. The radius of the solar system is, roughly, 10^{14} centimetres. This, on dividing by 10^{22}, becomes 10^{-8} centimetres, the radius of an atom. Neptune, one of the most 'detachable' planets we have, may be likened to a detachable electron. Its radius is about 10^{9} centimetres, and this reduced in the same proportion becomes 10^{-13} centimetres, the radius of an electron. The mass of Neptune bears about the same ratio to that of the solar system as that of an electron bears to that of a lithium or oxygen atom, so that the analogy still holds good. The distance between the sun and the nearest fixed star is about 10^{18} centimetres, and this, divided by 10^{22}, becomes 10^{-4} centimetres, or 0·001 millimetre, which is the mean free path of a molecule of air on a high mountain.

"If, besides reducing the linear dimensions from 10^{22} to 1, we suppose the present velocities of the heavenly bodies to be maintained, we obtain some very interesting and suggestive results. Since Neptune takes some 220 years to revolve once round the sun, its "frequency" of revolution (*i.e.*, revolutions per second) is $1{\cdot}5 \times 10^{-10}$. Since the path is reduced 10^{22} times, the frequency of describing it will be increased in the same proportion and will become $1{\cdot}5 \times 10^{12}$. This is the frequency of some infra-red waves of light. The frequency of the planet Mercury will become $1{\cdot}25 \times 10^{15}$, which lies in the ultra-violet. All the other planets will produce spectrum lines intermediate between these—*i.e.*, lying in the visible spectrum. The asteroids will produce a broad band instead of a line, and there will be certain extra lines due to perturbations of the planets by each other. *The solar system will, therefore, present a spectrum much resembling the spectrum of a chemical element.* This is a striking feature of the analogy between an atom and a planetary system.

"We may also, of course, reverse the process by taking the Lilliput world of the atom and the electron, and enlarging it by the factor 10^{22}, leaving all its velocities as they were. An atom of, say, oxygen would thus become of the same size as the solar system, and its two detachable electrons would closely resemble Uranus and Neptune as regards size, distance from the sun and period of revolution. One of the electrons more closely bound up with the atom, and assisting in producing the phenomena of magnetism and radiation, but not of conduction, might resemble the earth in size and distance from the sun, and might revolve round the latter in one sidereal year. We naturally expect an electron when enlarged to

the size of the earth, to be a perfectly smooth sphere. At least, so we are accustomed to find it described. But such a sphere is, in reality, absolutely inconceivable; nor is it necessary to imagine it to be so. An electron may have a structure resembling that of the earth in every particular, and yet not only could that make no difference to its electrical or astronomical properties, but the fact of its having such a structure would remain for ever unknown to us, considering the scale of phenomena which are accessible to our senses. We may, therefore, without in the least interfering with the efficiency of the electron as a universal vehicle of electrical manifestations, imagine it to be a veritable microcosm, a world in which life might not very materially differ from life on our earth. Indeed, considering that time and space would be reduced in the same constant and uniform proportion, it is doubtful whether our present instruments, thus suddenly transformed, would be able to indicate the occurrence of any fundamental change. This is but another illustration of the well-known principle that size and length of time are purely relative, and depend upon comparison with standards. If all dimensions, including the standards, were reduced in the same proportion, or if all things were accelerated or retarded in the same proportion, we should be absolutely unaware that anything had happened.

"On the other hand, if any intelligent being could be transferred from the microcosm to our present world, and could keep up some connection with the microcosm, his busy life here would appear to the inhabitants of the microcosm to be a changeless eternity, since any change measurable by them would take millions of their years to accomplish itself.

"We here enter upon the region of pure speculation, and it is not the function of a scientific work to deal with occult problems of that kind. But since the electron theory promises to guide us further into the mysteries of matter than anything attempted hitherto it is necessary to discuss the general prospect even cursorily. To sum up, we find in the fruitful and suggestive astronomico-chemical analogy a boundless vista of worlds within worlds, which, while rightly preventing us from setting a limit to the multiplicity of possible phenomena, comforts us with the reflection that for our purposes, and as far as our present senses are concerned, the multiplicity of phenomena has an absolute limit, which makes it possible to look forward to the eventual formulation of a theory embracing all phenomena accessible to our senses."

THE END.

CORRESPONDENCE.

THE TIMES BOOK CLUB.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IT may be of interest to the greater number of staff throughout the country to know that *The Times* Book Club has agreed to extend its "service subscription" to the employees of this Company. The subscription is three guineas per annum (5*s.* extra is charged to London subscribers if delivery is required), and will allow of eighteen books being taken out each week. This means that for less than 1*d.* a week each of the eighteen participants in the subscription get the choice almost of all books they would require to read.

The scheme was first started by me in the General Superintendent's Office last month, and was found to be entirely satisfactory; it has since been extended to two subscriptions in the Engineer-in-Chief's Department, one in the Secretary's Department at Head Office, and four at the London offices at Salisbury House.

In addition to a collection replete with every phase of literature, the library contains a fine selection of books on technology, including telephony, and a glance at the catalogue, which can be obtained from *The Times* Book Club, 376 to 384, Oxford Street, London, W., for 2*s.* 6*d.*, will show how comprehensive it is, not only in British, but also in foreign literature. The facility of being able to purchase cheap copies of the books taken out is also secured.

Districts, of course, would have to pay carriage of the box of books to and from a London terminus, and in many cases it should not be difficult to get a reasonable contract with the railway company.

Full information can be obtained from the book club at the above address, and I shall be pleased to give any information which anyone contemplating starting a subscription may require.

General Superintendent's Office. H. H. THOMSON.

THE TELEPHONING OF BOURNEMOUTH.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MY short article on the above, which appeared in the November issue, has brought forward an interesting little pamphlet, for which I have to thank Mr. A. D. Pike, local manager of Cheltenham, on the development of the telephone in Bournemouth twenty years ago. The following extracts from this pamphlet may be of some little interest. The italics are my own:—

"Although an exchange was only opened in Bournemouth in March of 1886, there are at the present time *almost* 200 subscribers, or to be exact 187, of which number 50 have been added during the past twelve months. A special feature in the subscribers at Bournemouth is that there are *upwards of* 40 private residents who avail themselves of the benefits of the telephone. The switchboard appears to the uninitiated to be a very complicated arrangement. Wires apparently in hopeless entanglement seem to be *clinging round the framework* of the board in an unmeaning and fantastic manner. The Company is evidently sanguine of *even further* support from Bournemouth, for they have provided a switchboard with a capacity of 500 exchange lines, considerably more than double the number at present using the exchange. As an indication of the extent of the business transacted through the medium of the exchange, it may be mentioned that an average of *between* 400 *and* 500 *calls are made during the day*. It was interesting to a visitor to the exchange to note the facility *and leisure* with which the operators perform their duties. Ringing up the representative in charge of the Company's office at Poole, a female voice replied in a clear and well-modulated tone, 'Who's there?' Having discussed that ever ready topic—the weather, enquired as to the prospects of trade at Poole and exchanged the usual civilities of the day, we turned our attention to the Company's electrician who repairs and fits up instruments for subscribers. The important town of Bournemouth appears to be a very successful field of telephony in the future."

The promise held out twenty years ago has been amply fulfilled, but what should we say in these days to a visitor to the exchange who entered into a long conversation with an operator on duty? This incident forms an excellent comparison between the easy-going service of those days and the strict attention to their operating duties which is now required from our operators.

E. HARPER, Local Manager, Bournemouth.

VALUE SHEETS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WE are finding a couple of "frames" made out of old backboards useful. They are the same size as the trays, but with no bottom and only half the depth. We take the value sheets out of the tray and as posted they are placed in a frame, which is slightly shaken now and again, the sheets then being in a perfectly straight condition for replacement in the tray. The frames can be made in a few minutes by a handy man and the material is generally, I think, available.

We are also supplying the operators with lists of all telephone numbers appearing in the 133 books each month. The tickets for these numbers being sent to the district office in a separate packet marked "List." This arrangement is also found very useful.

Reading, Feb. 12. A. GARNER.

CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

I SHOW below a question set in the "C" Course, Paper 1, this session, and also two answers, one which is awarded full marks (5) and the other two marks.

1. A distributing pole, to serve one open wire junction route only, is about to be erected, and is to be fed by a 25-pair underground cable. It is estimated that twenty circuits are required immediately, and that ultimately the 25-pair cable will be filled. How many arm slots should be cut in the pole for immediate use, and how many extra will be required ultimately? Eight-wire arms are to be used, and the open wires are to be run on the "twist" system. (5 marks).

Ans. (1). Awarded full marks (5)—

Twenty circuits run on the twist will require six eight-way arms.

Twenty-five circuits run on the twist will require eight eight-way arms.

Therefore six arms will be required immediately and two extra arms will be required ultimately.

Ans. (2). Awarded 1 mark (then altered to 2)

Arm slots for immediate use, six.

Arm slots for ultimate use, eight.

On receiving my paper which was answered as in the latter case, I returned it to Head Office, and asked the reason they had marked my answer "No explanation, 1 mark."

This is their reply: "It is never the practice to state specifically that working must be shown, but it must surely be obvious to you that it is impossible for an examiner to award full marks unless he has some means of knowing that the student has arrived at his results by some logical method and not by guesswork. Two marks should have been given for your answer and the marking has been amended."

My answer is that there is no working out, and I may say I tried many ways before putting the answer down direct.

I also fail to see any *logical* working out in the answer awarded full marks but only a partial copying out of the question, which we are distinctly requested not to do in the instructions at the beginning of the courses.

This way of marking papers surely reduces the efficiency of the courses, and is most disheartening to students who have spent a great deal of time and trouble doing the papers.

That this is not an isolated case I may add that I have several times had my papers returned with no marks for some answer which is perfectly correct, and on returning the papers have had the full marks inserted.

I feel sure many others must feel the same trouble, and I should be pleased if you would insert this in the next issue of the JOURNAL.

Leicester, Jan. 21. E. L. HAGUE, Exchange Inspector.

THE VALUE OF THE "UNSUCCESSFUL" INTERVIEW CARDS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. COOPER'S observations are very much to the point. Personally I consider that if the card in question is properly made out in the first instance, and faithfully and thoughtfully entered up subsequently, then provided it is kept in its proper place, it is of the utmost value. By the expression "proper

place," I mean in the place in which it can be found in a moment. My experience is that in all large districts the cards should be filed in strict alphabetical order of streets, in numerical sequence of house numbers, and the whole subdivided into the districts into which the area is split up for canvassing purposes. For example, if one wishes to locate a card of W. Smith, of 167, High Street, Old Town, a glance at the canvassing map would show the house to be in the "E" canvassing district, and a reference to the card drawer, or drawers, of the "E" district cards, kept as above stated, in London Post Office directory order, would produce the card at once. *But it is* here where the contract officer comes in. He it is of course who makes out, enters up, and files the cards after daily use and inspection by the contract manager or contract clerk, and my experience is that very few contract officers put their heart into this work. The net result is usually unsatisfactory—I might say heartbreaking—to the chief of a department who knows what could be done by the exercise of even a little care and trouble. To my mind, therefore, any suggestions towards methods of enabling the cards to be more carefully kept would be welcomed.

I strongly deprecate the keeping of new business and other cards with the "unsuccesstul" cards. Quick reference is my ideal, and if each class of card is filed separately this end is assisted. In small districts a slight exception may well be made by having a "subscriber's" card inserted in the "unsuccessful" card drawers, wherever a subscriber is located, but in a large district it is I find more convenient to have a complete set of "subscriber's" cards filed by themselves, in Post Office directory order.

Feb. 15. H. JULIUS MACLURE, Contract Manager, Birmingham.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. COOPER'S article contains many points of considerable interest to contract officers, and in view of the changes of policy at present pending this is undoubtedly an opportune time to weigh our methods in the balance. The suggestions put forward make me think that Mr. Cooper has failed to appreciate the value of the cards as explained in the instructions to which he has referred.

The idea of using the cards as a diary before they are filed in district and street order is new to me, and not referred to in the instructions of January, 1906. One place for the cards is enough and that in street order, and the officer should use an office diary to map out his future rounds.

The method of mixing the various kinds of live cards might be useful in a very small district, but can scarcely be recommended in a large district. I would suggest at least leaving out records of past subscribers.

Mr. Dalzell's idea was outlined at a time when there was reason to assume the business would continue without the interruption we now have to face. It is obvious that we must now cut our coat according to the cloth, but in the areas where canvassing has to be done the principle must be carried out if we mean to be successful. The reasons given for the twenty cards taken at random will not be accepted as final by the agent who is alive to the work he has to do.

The "point" which Mr. Cooper aims at is a vital one, and the card bearing a name, address and occupation in a district where we want orders can scarcely be an "encumbrance."

With regard to advertising matter I cannot say much; London is still too little developed to have rendered the cards of much value in this respect. I venture to suggest, however, that there is something wrong with the management if the cards are not as up to date as a directory printed at the most once a year.

I cannot follow the inconsistencies of the paragraph dealing with house to house canvassing. If the cards are handed over to a new man, why start another set for the same people? Hasn't a new man enough spirit to anticipate doing better than his predecessor and to recognise that the demands of life are changing daily, thus affording an ever-increasing opportunity of securing business?

Now Mr. Cooper asks an extraordinary question with regard to special canvassing, viz., "Has it yet been found that the tradesman is going to give his orders at a certain time because the contract manager is making a special canvass of his trade." I should doubt if there is a successful officer in the kingdom who has not experienced the receipt of orders from this source.

I am afraid that the arrangement of keeping all the cards must be different in the Bristol area to our system in London, and while Mr. Cooper is suggesting that the methods are cumbersome and costly it appears to me that we have yet to pay stricter attention to the instruction of January, 1906, in order to give due effect to the policy outlined at our recent meeting.

I entirely agree with and endorse the concluding paragraph of Mr. Cooper's article, and surely it will be within the discretion of the contract agent to make such alterations in the methods as will eliminate the keeping of records which become useless on account of plant difficulties.

Feb. 19. GEO. E. NICHOLLS,
Divisional Contract Agent, Northern District, London.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. COOPER, in his article on the above subject, makes an attack which is hardly warranted, and I venture to think that he has not attempted to apply the cards in the manner laid down by Head Office. It is far easier to criticise an existing state of affairs than to initiate a new system. Failing a better, let us make the best of what we have, and I suggest that Mr. Cooper is not dealing with the cards in the right spirit. It would not be very difficult to confound Mr. Cooper by his own article, but if his intention is to get the matter thoroughly discussed through the columns of the JOURNAL no doubt much good will come of it, for no one admits the system under discussion the acme of perfection, but to be more or less elastic to meet the requirements of different districts. Referring to Mr. Cooper's article, paragraph 5, we find that the cards he takes at random bearing the words "no good," "cannot afford," etc. I would point out that these are not reports of interviews, and are practically useless, but they are exactly what Head Office says must be avoided, and exactly opposite to Mr. Dalzell's "ideal." For the cards to be of use they must be kept properly, and if Mr. Cooper cannot get his staff to give the required information, carefully tabulated, it is not the fault of the system.

In the next paragraph Mr. Cooper says that as soon as a card bears the report that the prospective subscriber "definitely declines" to sign, the card should be destroyed, as it is encumbrance. And yet later he takes the trouble to show that one who has "definitely declined" several times during the last three years was quite recently induced to sign. Because a man "definitely declines" service it does not follow that he has not to be called upon again, and so long as he is being called upon a card ought to be kept giving a record of the "tussle!" to get the signature. The history tabulated on some of the unsuccessful interview cards makes interesting reading.

As for using the cards when sending out advertisement matter, the card system needs no champion. Before making a call on a prospective subscriber, the contract officer gets the name from the streets directory, so that he can go without hesitation straight to the occupier. If the directory be not correct, the correction can be found on the card and, in districts where removals are frequent, the cards should be more reliable than the directory. As for house-to-house canvass, I do not see how this affects the card system, for this canvass can be made whether cards are kept or not, but where kept the calls can be recorded just the same.

When a new man joins the Company the cards are a distinct advantage, He has handed to him the cards kept by the contract officer previously on that district, which are undoubtedly useful, for the new man is immediately in his "stride," and the remarks on the cards made by his predecessor should show clearly what has transpired in previous interviews, giving him the threads so that he may take up the conversation where the previous contract officer had left off.

The new business cards are certainly a help to the clerk, if for nothing else than when compiling his return. Each day a batch of agreements are forwarded to the Works Order Department, and, if no record were kept, what trouble there would be in tracing any mistake or replying to any query raised in connection with the returns.

The great trouble in connection with the cards is to get the contract officers to keep them up to date, for most of them are inclined to shirk this work where possible, but all the same the discipline involved does the department no harm. Perhaps, if Mr. Cooper would give particulars of how the cards are dealt with in his district, he may get some useful hints from other contract managers. An exchange of experiences could not do any harm and may prove of benefit. Some permanent check of the work done by the contract officer is necessary and, failing a better system, it behoves us to make the best of what we have.

As an inducement for the contract officer to keep his cards in order the following may be useful:—

Suppose an enquiry comes into the office for service at a given address. If the contract officer can show a card giving particulars of his calls at that address—give him credit for the order. If no card—no credit for the order, but an explanation is requested as to why this address has been missed. A few cases of this sort will soon convince contract officers that there should be a card for every non-subscrtber in their respective districts, otherwise the credit for orders will be lost to them, while distrust may ensue.

In conclusion, I must agree with Mr. Cooper that the card system may be carried to the extreme, but some record of work done is necessary. A lot more could be added to this letter, but I hope to see the matter taken up by all concerned, with a good discussion to follow.

Hull. "NORTHERN PROVINCE."

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the paragraph under this heading in Mr. Swain's article in last month's JOURNAL, I was glad to see that he appreciates the value of the operators working "in one continuous line side by side." Apparently, from this, Mr. Swain is no advocate of the system of setting the different operators or divisions of operators in an exchange in competition with one another and comparing their work by an analysis of the service observation records, as was advocated by Mr. Coombs in his article on "Team Work" in the October, 1907, number of the JOURNAL.

Obviously, where a system of comparing the work of, say, the different divisions or of the supervisors is carried out, the team work cannot be continuous, as the divisions will not be anxious to help their rivals by answering calls originating on their positions, and the service given at the positions at the ends of the divisions must therefore suffer, no matter how good the supervision may be. The only way to maintain a uniformly good service under these conditions would be to lighten the loads on the end positions of the divisions, as is done on the end positions of the switchboard, and this remedy would, of course, produce bad results in another direction, as it would very much decrease the capacity of the exchange.

It seems clear to me, therefore, that, to obtain full value from team work, there must be no antagonism between the divisions, and that a team must consist of the whole staff of the exchange and not of any limited number of operators.

As team work has thus no connection with what are ordinarily known as "teams," I have in this letter referred to these as "divisions." The use of this term carries the mind away from any connection between team work and any small group of individuals and helps to foster the idea that the whole staff must work together with only one object in view, that of giving the best service from the exchange *as a whole*.

Engineer-in-Chief's Office, Feb. 22. W. DUFF STEWART.

NEWS OF THE STAFF.

Mr. C. ELLIOTT, late Metropolitan Engineer, on his transfer to Gloucester as District Manager, was on Jan. 30 presented, on behalf of his late London and Head Office colleagues and the Metropolitan Engineer's staff, with a serviceable kit bag and suit case as a momento of thirteen years' service in London, and an expression of good wishes for his future good health and welfare. Mr. C. B. Clay in course of a few appropriate remarks made the presentation, and the recipient suitably responded.

Mr. D. B. FULTON, District Manager, Gloucester, on the occasion of his transfer to the Engineer-in-Chief's Department, was presented by Mr. W. J. Hodgetts, Local Manager, Stroud, on behalf of the Gloucester district staff, with a gold open curb double albert, and as a token of esteemed regard to Mrs. Fulton she was presented with an amethyst and pearl pendant and brooch combined. Mr. A. D. Pike, Local Manager, Cheltenham, and head officers of the various departments spoke as to the general progress of the district whilst under the control of Mr. Fulton, and thanked him for the kind and unselfish consideration he had displayed towards the staff. Best wishes were conveyed to Mr. Fulton for a successful and prosperous career.

The whole of the exchanges in the Sussex district have now been placed under the control of the Traffic Manager, Brighton (Mr. F. J. FROST), who has hitherto supervised the exchanges in the Brighton area only.

Mr. L. BIGNELL has been promoted from position of Exchange Inspector, East, to that of Exchange Electrician, Woolwich.

Mr. H. W. MILLICAN, Inspector, Carlisle, was presented with a writing desk on his being transferred to Kendal in a similar capacity.

Mr. F. LUCAS, Contract Manager, Wolverhampton, has been transferred to fill a similar position at Hanley. Before leaving he was presented by the district staff with an umbrella and walking stick. The presentation was made by the District Manager, Mr. Archer W. Smith.

Mr. C. F. SPEARS, Contract Officer, Birmingham, has been promoted to be Contract Manager, Wolverhampton, in place of Mr. F. Lucas.

Inspector ALFRED OWEN, of the Liverpool electrical staff, has been promoted to the post of Chief Inspector at Stockport.

Mr. H. J. RAINES, Rentals Clerk, has been appointed Cost Clerk at Luton.

Mr. E. J. JOHNSON, Sheffield, has been elected an Associate Member of the Institution of Electrical Engineers.

Miss V. A. SLATER, who has completed twelve years' service with the Company, has been promoted from the position of Clerk-in-Charge, Rochdale, to that of Clerk-in-Charge, Bolton. On the occasion of her transfer, the switchroom staff, Rochdale, presented her with a gold brooch in the form of a hand microphone with pearl disc centre as receiver. The gift was accompanied with the good wishes of her old staff for her future success.

Mr. WALTER NICHOLLS, Clerk, has been transferred from the Contract Department, Norwich, to the office of the Metropolitan Electrician.

Miss F. M. BROUGHTON, Chief Trunk Fee Clerk, on leaving the Company's service was presented by the staff with an oak table. The District Manager, when making the presentation, alluded to Miss Broughton's long and valuable services, and expressed the best wishes of the staff, being ably seconded by the Chief Clerk.

Mr. E. C. TREMBETT, late of Exeter district, has been appointed Storekeeper at Plymouth.

Mr. JOHN R. L. LAMMING, Inspector, on leaving the service of the Company at York to enter the employ of the Western Electric Company at North Woolwich was presented with a dressing case.

Mr. J. STONES, Inspector, York, has also left the service to take up a similar situation with the Western Electric Company.

Mr. W. L. TAYLOR, Night Operator, Reading, has been promoted to be Inspector, Ascot.

Mr. L. O. CANE, Wayleave Officer, Maidenhead, has been transferred to Reading as Contract Officer.

Mr. CHARLES F. SPEARS, Contract Officer, Birmingham, has been transferred to Wolverhampton as Contract Manager; HUGH MCLEAN, Fitter, to Nottingham; and JAMES GALLOWAY, Inspector, to Chester.

Mr. G. H. RUSSELL, Rentals Clerk at Chester, has been promoted to be Cost Clerk.

Mr. F. BEAZLEY, Electrical Learner, Waterford, has been transferred to Cork, as Junior Inspector. He was presented wtth a dressing case by the Waterford staff on the occasion of his leaving that centre.

Miss AGNES SAUNDERSON, Clarkston Exchange, Glasgow, succeeds Miss McKerracher as Operator-in-Charge.

Miss MARGARET WILKIE, Gorbals Exchange, Glasgow district, has been promoted to be Travelling Supervisor, Mid-Lanark district.

Miss ANNIE HENRY, Bridgeton Exchange, Glasgow district, has been promoted to be Travelling Supervisor, Ayrshire district.

London Traffic Department.—*Promotions and Transfers:*

Miss EVA SHERBURN, Supervisor, Avenue, has been transferred in a similar capacity to Holborn.

Miss EMILY NICHOLLS, Supervisor, Hop, has been promoted to be Senior Supervisor, Westminster.

Miss JANE FREEMAN, Senior Operator, East, has been made Operator-in-Charge, Woodford.

Miss MARIE COWARD, Supervisor, Gerrard, has been transferred as Supervisor-in-Charge to Wimbledon.

Miss MAUD C. NELLER, Supervisor-in-Charge, Wimbledon, has been transferred as Monitor to Avenue.

Miss ALICE BOWLEY, Supervisor, Holborn, has been transferred to be Supervisor, Hop.

Miss MABEL WILLES, Operator, Avenue, has been promoted to be Supervisor, Bank.

Miss CHARLOTTE JEFFRIES, Operator, Hop, has been promoted to be Supervisor, Gerrard.

Miss GERTRUDE GARDNER, Supervisor, Bank, has been transferred as Supervisor to London Wall.

MARRIAGES.

Miss MARY ELLEN CAMPBELL, Clerk-in-Charge, Central Exchange, Swansea, who has resigned the Company's service to be married, was presented on leaving with a handsome crown Derby dinner service and a handbag. The presentation was made on behalf of the staff by Mr. W. E. Gauntlett (District Manager).

Miss HENRIETTA DAGGER, Clerk-in-Charge, Central Exchange, resigned from the Company's service to be married, after 21 years' service. She was presented by the staff with a number of handsome presents, among them being an eiderdown quilt, cutlery, glass and table linen, the presents amounting in the aggregate to 22. She was a general favourite with everyone, and will be greatly missed.

Mr. G. H. BUSH, Engineer-in-Chief's Department, on the occasion of his marriage, which took place on Dec. 26, was presented with a service of cutlery by the members of the Engineer-in-Chief's staff.

Friends of Miss M. C. STEVEN, who left Westminster Exchange in January, 1907, to take up a position as Clerk-in-Charge, Colombo, will be interested to hear that she was married on Jan. 28 to Mr. T. F. Webb, of the Orient Company, Limited, at St. Andrew's Church, Colpetty, near Colombo.

Mr. W. S. KAY, Wolverhampton, was married on Jan. 30, the district staff presenting him with a handsome oak hallstand. The presentation was made by the District Manager, Mr. Archer W. Smith.

Miss JESSIE MCKERRACHER, Operator-in-Charge, Clarkston Exchange, Glasgow, left the Company's service on Jan. 16 to be married. She was the recipient of several presents from members of the staff,

Miss E. RELTON, Operator, Scarborough, resigned on Jan. 14 in view of her approaching marriage. She was the recipient of various presents from the Scarborough and Filey staffs.

Mr. J. H. SHIELDS, Assistant Test Clerk, Belfast, was presented by the staff with a handsome antique brass curb and fire irons, and solid walnut overmantle, on the occasion of his recent marriage. The presentation was made by Mr. Pulford, Chief Inspector.

Mr. J. P. HASLAM, Cashier, Bolton, was presented with a silver cake stand by the operating, clerical and electrical staffs of the Bolton centre on the occasion of his marriage. Mr. Haslam is having a short holiday, and was sent off with the best of good wishes from the staff.

OBITUARY.

It is with regret that we have to record the death of Mr. NATT MICHAEL KELLY, Foreman, of Huddersfield, who died of consumption on Feb. 13. The deceased obtained a grant from the Gaine Memorial Fund in August last, and benefited from a visit to the Sandgate Sanatorium. After working again for about three months a recurrence of the malady took place and he gradually became worse, and passed away as above stated, having served nine years in the Company's service. The Huddersfield staff forwarded a wreath.

Miss ETHEL FIRTH passed away on Jan. 28 after a long and painful illness. She was an Operator at the Leeds Exchange for two years, but owing to ill-health was compelled to resign her position in October, 1907. She was very much esteemed by her fellow-workers, and her early death is deeply regretted.

Mr. THOS. WICKHAM, resident caretaker at Barrow-in-Furness for the past sixteen years, who during the last few years has acted as Storekeeper and Canvasser, passed away on Feb. 12 after a long and painful illness. The immediate cause of his death was a tumour which had greatly affected his health during the last few years. At his funeral, which took place on Feb. 15, the Company was represented by Mr. D. C. Dunnett, the Chief Inspector, and a wreath was sent by the Barrow staff as a token of their sympathy.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—The fifth meeting of the above society, presided over by Mr. Tucker, was held on Feb. 2, when Mr. Scott, the Assistant Provincial Superintendent, read a paper entitled "Some Notes on Management."

Birmingham Operators.—The fifth meeting of the session took place on Feb. 11, when a paper was read by Miss F. Minter, Examining Matron, London, entitled "Telephone Operating as a Career." The paper was greatly appreciated by all present, and various interesting points and experiences were dealt with on the career of the operator from the learner to clerk-in-charge. Mr. C. W. Piggott was in the chair.

Bolton.—The fourth meeting was held on Feb. 18, Mr. A. C. Haley, District Manager, being in the chair. Mr. Prout, Assistant Provincial Superintendent, lectured on the "Prospect and Retrospect of Telephony," showing the remarkable growth of the Company's business and magnitude of the service, and illustrated his lecture by a series of interesting and exceptionally good lantern slides.

Bradford.—On Jan. 21 Mr. J. Shackleton, of the Engineering Department, gave an address on "Notes on Engineering Construction" to a fairly large gathering.

On Jan. 28 Mr. Latimer, of the Engineering Department, gave a lantern lecture on "Cable Construction," which provided a very interesting discussion.

On Feb. 10 short papers were given by members of the Halifax staff, Mr. Cookson dealing with "Automatic Boxes," and Mr. Cocksoft with "Maintenance and Instrument Supervision." A long discussion took place on these subjects.

Brighton.—A meeting was held on Jan. 27, when the following three competitive papers were read:—"The Life of a Works Order," by Mr. W. Young; "Hints on Storekeeping," by Mr. E. H. Elliott; "The Company from a Public Standpoint," by Mr. F. H. Chaplin. The prize was given to Mr. Elliott.

On Feb. 10 three additional competitive papers were read, viz.: "Methods of Testing," by Mr. F. Crease; "Magneto and Party Line Faults," by Mr. A.

Brackley; "Magneto Sub-Exchanges," by Mr. H. Summarsell. An interesting discussion followed each paper, and the prize was awarded to Mr. F. Crease. Mr. C. F. Moorhouse, District Manager, was in the chair on both occasions.

Bristol.—The fifth meeting took place on Feb. 18, when Mr. Fray, of the Engineer-in-Chief's Department, gave a lecture on "Engineering Designing as Governed by Costs." The lecture was illustrated by lantern slides of various curves.

Cardiff.—The fourth meeting was held at the St. John's Schoolroom on Jan. 21, Mr. W. H. Kirk, vice-president, being in the chair. There was a good muster present. A paper was read by Mr. S. F. Whetton (Chief Inspector, Cardiff), entitled "Common Battery Working." The lecturer dealt with his paper in a very lucid manner, outlining the working of the common battery system and illustrating it with diagrams of the new exchange at Cardiff.

Cardiff Operators.—The monthly meeting of this society was held on Feb. 9. Owing to the inclemency of the weather the attendance was smaller than was anticipated, there being 33 present, as well as the president and vice-presidents. Mr. Dalzell, the Provincial Superintendent, gave a lecture on "General Operating and Recording of Calls." During the course of the lecture several items of importance in connection with the measured rate service were brought forward for discussion.

Cheltenham.—The seventh meeting was held on Jan. 21, when Mr. J. W. Hodgetts (Stroud) gave his paper on "Aerial Cables and Overhead Construction." An interesting discussion followed. The whole of the available staff and several guests were present.

The eighth meeting was held on Feb. 2, when Mr. G. R. Collings gave a paper on "Party Line Working and Faults," illustrated by large scale diagrams. The whole available staff was present.

Coventry (South Midland).—A meeting was held on Feb. 17, when Mr. J. N. Lowe presided over a fair attendance of members. Mr. F. G. C. Baldwin, District Engineer, Birmingham, gave a lantern lecture on the "Manipulation of Dry-Core Cables."

Cork.—At a meeting on Jan. 22 (Mr. A. M. Kidd, District Manager, presiding), Mr. Denis Murphy, Test Clerk, read a paper entitled "Sound Illustrated," giving some very interesting information.

At an adjourned meeting held on Feb. 9 (Mr. Kidd also in the chair), and before a good attendance, Mr. R. Surplice, Chief Clerk, read a paper on "District Office Routine," which dealt fully with revenue, capital and monthly returns and in which the speaker showed a marked knowledge in every detail.

Dover.—A successful meeting was held in the district offices on Feb. 16, when the following papers were given:—"Instrument Faults," by Mr. F. E. Faithfull (Chief Inspector), Folkestone, "Stocktaking," by Mr. E. W. Wilson (Cost Clerk) District Office; 63 per cent. of the total number of members were present, and five visitors.

Dublin.—The meeting which was scheduled to be held on Jan. 27 was unavoidably postponed until Feb. 3, when Mr. A. W. Dalton, Chief Test Clerk, read a paper on "Fitting and Faults." The chair was taken by the District Manager.

Exeter.—A meeting was held on Feb. 16 presided over by Mr. H. Reid, when Mr. W. H. Robnett, Chief Inspector, Torquay, gave a paper on "Switchboard Development."

Glasgow.—The fifth meeting of the session was held in the Technical College on Jan. 27. Mr. Wm. Napier, of Head Office, lectured upon "Traffic." The lecturer dealt exhaustively with the value of traffic records, and showed the manner in which such records decided the size of new exchanges and of their equipment.

A meeting was held in the Technical College on Feb. 10, and took the form of a "Magazine Night." Ten papers were submitted, and the following seven were read:—"Transmission of Thought," J. M. Stewart; "Cost of Power for Small Exchanges," H. G. Townsend; "Does the Telephone tend towards Physical Degeneration?" Wm. Patterson; "Periodic Inspection of Tools, J. McMeeking; "Essentials to the Success of a Telephone Society," J. F. Scott; "Inspectors, their Duties, and How to Perform Them," L. Summers; "Dirge on Telephone Labour," Anonymous. An animated discussion followed most of the papers, and the magazine night proved a complete success.

Gloucester.—On Feb. 4 the fourth meeting of the session was held. Mr. C. Elliott, District Manager, presided. A paper was read by Mr. W. J. Norman, Chief Clerk, the subject being "Monthly Returns." Each return was explained as to their relationship to the various departments, illustrated by diagrams.

Hastings.—A telephone society has been formed at Hastings with a membership of 21. Although commencing late in the season, a successful session is anticipated. The society was opened on Feb. 11 by the District Manager (Mr. C. F. Moorhouse), who gave a paper on "Notes on Management." Mr. E. Armstrong, the Local Manager, was in the chair. The next meeting is on March 2.

Hull.—The meeting held on Jan. 29 was devoted to "Alternating Currents," when an extempore lecture was given by Mr. J. Riley.

On Feb. 12 a paper was given by Mr. Slingsby entitled "The Construction of a Common Battery Switchboard." It touched upon general construction, multiple and local jacks, lamp jacks, difference in Kellogg method of wiring to Western Electric, and saving of cable in construction of building.

Isle of Man.—The fourth meeting was held on Jan. 22, when a paper was read by Mr. C. F. Street, from the Engineer-in-Chief's Department, London, on "Points in Laying Underground Cables."

The fifth meeting was held on Feb. 5, when a paper was read by J. E. Cowley, Clerk, on "Stores Bookkeeping." As a finish to the evening some very amusing phonograph records were given by Mr. Gillmore, the District Manager.

Kilmarnock.—A meeting was held in the district office on Jan. 27. Mr. J. Grant read a paper on "Transmitters and Receivers." There was a good attendance.

A further meeting was held on Feb. 10, when Miss Higgins gave a paper on the subject of "Operating." There was a large attendance. Mr. G. A. McDonald was in the chair on both occasions.

Leeds.—The ninth meeting of the session was held on Feb. 10, the subject being "The Advance of Telephony." Five papers were read, viz., by Mr. F. McGraw, Mr. A. Burdett, Mr. Scutt (for Mr. C. W. Halliday), Mr. G. H. Sargeant, and Mr. B. Robinson. Mr. P. S. Niemann was down to read another, but at his own request it was taken as read. At the conclusion of the reading prizes of the value of half a guinea each, were presented to Mr. F. McGraw, who had been adjudged as having sent in the best technical paper, and to Mr. A. Burdett, who had been adjudged as having sent in the best commercial paper. Mr. J. Tattersall, of Hull, was the adjudicator.

Leicester.—Mr. Fray, Engineer-in-Chief's Department, gave a most interesting paper on "Notes on Engineering Construction" to the members of the above society on Jan. 20.

On Feb. 12 Miss Doris Renwick, junior operator, Leicester, read a paper on "Operating," which was much appreciated by the members. Mr. S. B. Balmer also lectured on the "Clerical Work of the Complaints Department."

London.—A meeting was held at Salisbury House on Jan. 25. There was an attendance of 109 members, the president, Mr. H. Davis, being in the chair, and Mr. J. N. Shackleton read his paper entitled "Notes on Engineering Construction." The following members took part in a discussion which followed: Messrs. Harding, C. E. Tattersall, H. Davis, A. Watts, L. Henry Lowe, P. T. Wood, F. Dowdall, C. J. Barker, J. F. Edmonds, F. W. Hibberd and F. Gill.

A course of eight lectures affording some elementary knowledge of the Company's methods and work done in various departments has been arranged to be delivered in the dining room at 58-9, London Wall. "Operating," Mr. H. Corner, Feb. 1 and 15; "Company's Bookkeeping," Mr. R. Bryson, March 8 and 22; "Apparatus," Mr. P. T. Wood, April 5 and 19; "Outside Engineering," Mr. C. E. Tattersall, May 3 and 17. After the lecture, members will have an opportunity of making remarks or asking questions. If the experiment is successful a further course on similar lines will probably be conducted next session. The first two lectures have been given with very satisfactory results.

London (Southern).—The monthly meeting of the society was held on Jan. 19, when a paper, illustrated by lantern slides, was read by Mr. P. J. Ridd, president, on "Common Battery Private Branch Exchanges." The paper dealt specially with the question of long extension service, and described the various methods that have been adopted to overcome the difficulties introduced.

Liverpool.—The fifth meeting of the session was held on Jan. 21, Mr. R. Shepherd, Provincial Superintendent, in the chair, in the unavoidable absence of the president, Mr. E. J. Hidden. Two papers were read, "Operating," by Miss Ferguson, and "Monitors' Table," by Miss Lee. Both articles were excellently written and very lucid.

Luton.—On Jan. 21 Mr. Spencer Maber, Local Manager, Ware, gave a paper entitled "Ware Centre: Its Start and Development."

Manchester.—On Jan. 15 a paper was read by Mr. Osbourn of the Engineer-in-Chief's staff on "Testing and Fault Localisation." The paper was illustrated by lantern slides and a working testing set with mirror galvanometer.

On Jan. 22 a paper was read by Mr. G. S Wallace on "Private Branch Exchanges."

On Feb. 12 a paper was read by Mr. F. W. Taylor, District Manager, on "The Petrol Pump and Dry Air Process." It was illustrated by working diagrams and experiments.

Newcastle.—The third meeting was held in the Mining Lecture Hall, on Jan. 19. Mr. A. L. E. Drummond, District Manager, was in the chair, and a good attendance of members was present. The chairman introduced the speaker for the evening, Mr. Fray, of the Engineer-in-Chief's Department, whose subject was "Notes on Engineering Construction," which was illustrated by lantern slides.

Newcastle (Sunderland and South Shields Branch).—The third meeting was held at Sundertand on Jan. 8, Mr. E. Spink was in the chair. After formal business had been passed the chairman called upon Mr. A. Livingstone to give his paper "Electrical Terms and Units." A second paper was given by Mr. G. W. Priestman on "Common Battery Switchboards and their Working."

The fourth meeting was held at Sunderland on Feb. 5, the president, Mr. E. Spink, being in the chair. The paper was given by Mr. James Reay on "Construction of Field Telegraph and Telephone Lines, and other Means of Communication with the Army in South Africa." There being some time to spare a discussion took place amongst the members on the subject of "Line and Instrument Faults." The various faults and their causes were dealt with, together with the causes of some difficult ones.

Nottingham Factory.—The sixth meeting took place on Jan. 25, Mr. C. E. Fenton presiding, 109 being present. Mr. H. R. Honick, Chief Switchboard Fitter, gave a very instructive paper on "Relays" as used in telephony, illustrated by a number of excellent slides showing the principal relays in use in the Company's service, and by diagrams fully explaining their working.

Nottingham.—On Jan. 29 a paper on "Development Duties" was read by Mr. W. B. Crompton, of the Engineer-in-Chief's Department, illustrated by diagrams, plans and lantern slides.

Oldham.—A lecture was given by Mr. J. W. Taylor, Exchange Inspector, Oldham, on Jan. 26, upon the subject of "Sound and its Transmission." The lecture was illustrated by diagrams and experiments to show the relationship of sound waves in connection with the telephone. The use of the manometric flame and revolving mirrors in connection with the amplitude, pitch and quality of sound waves was explained, together with the various stages of the telephone since 1873.

Portsmouth.—On Jan. 28 a paper was read before this society by Mr. Pharo, Traffic Manager, on "Motors and Dynamos" as applied to telephony; illustrated by lantern slides kindly loaned by Head Office and diagrams showing the windings, &c., of the different types of machines.

On Feb. 9 Mr. Newnham, Service Inspector, gave a paper on "Traffic Observations," illustrated by lantern slides. The chair was taken by Mr. S. J. Smith, District Manager, on each occasion.

Plymouth.—A meeting took place on Jan. 27, when Mr. F. Knight gave a paper on "Telephone Troubles," and Miss E. E. Westlake one on "Magneto Working." Thirty members were present at this meeting.

On Feb. 17 another meeting was held when Mr. S. R. Harris gave a paper on "Test Room Work," and Mr. G. S. Annear followed with one on "Stores." There was a good percentage of members present. A library is being formed in connection with this society.

Sheffield.—A paper on "Transmission" was given by Mr. B. S. Cohen, of the Engineer-in-Chief's Office, on Feb. 5, 1909. It aroused considerable interest in this important subject, which it is hoped will be maintained, and was illustrated by a number of lantern slides.

Swansea.—A combined meeting of the general and the operators' societies took place in the Lecture Hall of the Public Library on Feb. 17, when a paper was given by Mr. R. A. Dalzell (Provincial Superintendent) entitled "A Review of Progress in the Western Province and Some Notes on Papers Read by the General Superintendent and Mr. Hare." A pleasant little ceremony in the form of a presentation to Miss M. E. Campbell, secretary of the Operator's Society since its formation three years ago, brought the proceedings to a conclusion.

Tunbridge Wells.—The third meeting was held at Ralphs' Restaurant on Feb. 9, when Mr. S. C. Smith (District Manager) gave his interesting lecture, "The History and Development of the Telephone Switchboard."

Warrington.—The fourth meeting of the society was held on Jan. 27, when papers were given by Mr. H. Sherrington on "Fitting," and Mr. J. Ewing on "Engineering Notes." In each instance technical phrases were avoided as far as possible, and the subjects treated in a general way which enabled the readers, representing the various departments, to follow the arguments very clearly.

The District Manager, Mr. H. Chambers, presided over a fairly good attendance of members at the fifth meeting held at the district office on Feb. 17. Mr. F. Eastwood gave a paper entitled "Notes on the Care and Maintenance of Switchboards in Local and Sub-Exchanges," and Mr. T. Day spoke upon "Overhead Construction." The lectures were illustrated by means of carefully prepared diagrams.

STAFF GATHERINGS AND SPORTS.

Glasgow.—The *annual dinner* of the Glasgow staff was held in the Prince of Wales Restaurant, Buchanan Street, on Jan. 29. Mr. W. A. Valentine, who occupied the chair, was accompanied by Mr. D. Johnstone Smith, Mr. Walter Webber (Postmaster), Mr. F. Douglas Watson, Mr. John Scott (Midland province), Mr. James Andrew (the Company's Local Solicitor), and by all the Scottish District Managers. The speech-making was of a very happy order. After the usual loyal toasts had been honoured, the chairman proposed that of "The Company," and this was replied to in an interesting and racy speech by Mr. Johnstone Smith. Mr Stewart, of Edinburgh, proposed "Our Guests," and this was replied to by Mr. Webber, who expressed his pleasure at being present for the first time at this annual gathering. Mr. Rodger proposed "Other Centres," which was acknowledged in a neat speech by Mr. Lamb, of Greenock, and to Mr. J. R. Brown was given "The Chairman," who replied in a few words. The programme was interspersed with songs and readings, which were much appreciated, and an interesting part of the proceedings was a presentation to Mr. F. Douglas Watson to mark the completion of 25 years' service with the Company. This consisted of a set of silver ornaments for use with full Highland costume, also a silver rose-bowl and opal and diamond pendant for Mrs. Watson. These were presented on behalf of the staff by Mr. W. Brown, of Dundee, who has been longest associated with Mr. Watson in a managerial capacity, and by Mr. John Scott, who spoke principally on behalf of those who were at one time but are not now members of the staff in the Scottish province. Congratulatory telegrams were received from the President, the General Superintendent, the Engineer-in-Chief and staff, Mr. Coleman (Midland province), and others. After a few further words of congratulation from Mr. Johnstone Smith, Mr. Watson in a reminiscent speech thanked the staff on his own behalf and on that of Mrs. Watson.

Operators' Society and Club.—The fourth meeting of the session in the form of a social evening was held on Feb. 5. There was a large attendance of members, and also a number of guests. After tea, Mr. Valentine, District Manager, who presided, opened the meeting with a few appropriate remarks. Thereafter a programme consisting of songs, readings, a dramatic sketch and dancing was provided and much enjoyed.

Dublin.—The fourth annual staff dance was held at Sackville Street, Dublin, on Jan. 29. A most enjoyable evening was spent; dancing commenced at 8.30 p.m., and was continued until the small hours of the morning. The number present was 200, and amongst these were Messrs. P. F. Currall (District Manager) and C. H. Redhead (Engineer). The success of the dance was due to the efforts of Messrs. J. McShane, hon. secretary, J. M. Carey, and J. Tyrrell, M.C.'s, ably assisted by a committee of six.

Aberdeen.—A highly successful "At Home" was held at Telephone House, Aberdeen, on Feb. 17, to mark the occasion of the removal of the District and Contract Departments' staffs into the new premises now approaching completion. For the evening the district and contract staffs assumed the part of hosts to the operating and electrical staffs, and a very successful evening resulted in consequence. An excellent musical programme was submitted, together with a dramatic sketch which was presented by a caste from the district office. On arrival the company was welcomed by Mr. E. E. Stockens, District Manager, who conveyed Mr. F. D. Watson's regrets for his absence. During the evening dancing was also engaged in, and a very happy evening was brought to a close about 1.30 a.m.

Swansea.—The second annual whist drive and dance took place at the Hotel Cameron on Feb. 5, when a large gathering of the staff and friends numbering 150 spent a most enjoyable evening. The prize-winners in the whist drive were Miss D. Geoghegan (ladies) and Mr. Drysdale (gentlemen). Consolation prizes were gained by Mrs. Gauntlett and Mr. Bruton. There were some tasteful fancy dresses, prizes for the best of which were awarded as follows:—Ladies, Miss E. Davies (Japanese girl); gentlemen, Mr. F. H. Pearce (cowboy). Mr. Gauntlett adjudicated, and the prizes were distributed by Mrs. Gauntlett. The arrangements were in every way excellent, and the committee are to be congratulated.

Dundee.—The district staff held their annual dance at the Royal Hotel, Dundee, on Feb. 12, when over 80 couples attended. Mr. Brown, District Manager, presided at the supper, and in the course of a few remarks referred to the pleasing fact that the dance had been well supported by the staff, and that the company included representatives from Glasgow and Perth. A most enjoyable evening was spent under the guidance of Messrs. Greig and Forrester, M.C.'s. *The wall programmes, which were designed and prepared by Mr. D. T. Gordon*, draughtsman, were much admired.

Gloucester.—A most successful dance and whist drive was held on Feb. 18 at The Northgate Mansions. There were about 180 of the staff and their friends present, including parties from Cheltenham, Stroud, Hereford and Lydney, and members of the Gloucester Civil Service. There were also present Mr. D. B. Fulton (president), who travelled down from London especially for the occasion, and Mrs. Fulton, Mr. Elliott (District Manager) and Mrs. Elliott. The duties of M.C. were efficiently carried out by Mr. J. L. de Medewe, ably assisted by the stewards, Messrs. A. D. Pike, T. H. Thompson, F. Haines, and Captain Harrhy. Much credit is also due to the organising committee. Dancing was continued into the small hours.

Hull.—*Staff Cricket and Tennis Club*.—The second dance of the season in connection with this club was held on Feb. 9 at the St. George's Hall. The room was tastefully decorated and the 140 dancers enjoyed themselves thoroughly, the effort being a social and financial success. A large number of the non-dancing portion of the staff were present as spectators. The duties of M.C.'s were ably carried out by Messrs. C. Booth and J. A. Gomersall.

Norwich.—A very enjoyable football match (association) was played on the Royal Naval Hospital Ground, Great Yarmouth, on Jan. 30, between the Norwich and Yarmouth staffs, for the possession of the Megohm Challenge Cup. A well-contested game ended in the defeat of the Norwich team by 3 goals to 2, the winning goal being scored in absolutely the last second of the match. The team sat down to tea together after the match with their supporters at the Holkham Hotel, where subsequently a very pleasant musical evening was spent under the chairmanship of Mr. J. D. Pugh, the Local Manager, Great Yarmouth.

Sheffield.—On Jan. 23 in a sharp atmosphere and on a frost-bound ground the Sheffield and Leeds staffs tried conclusions at football at Roe Lane, Sheffield. Sheffield from the start had most of the play and after a capital game ran out winners 11 to 1. After the match Sheffield entertained Leeds to tea at the Mikado Café, thus bringing to a close a most enjoyable day. The return match at Leeds, it is hoped, will be played early in March.

Social Club.—The fourth annual gathering took place on Feb. 12 at the Victoria Café, Fargate, and proved as great a success as in former years. Dancing was carried on all the evening, accompanied by Mr. C. Needham's band, whilst a whist drive for the non-dancers was much appreciated. During the evening a series of cinematograph films by the Sheffield Photo Company gave much enjoyment. This club was started four years ago by Mr. H. G. Rowe who still retains the position of secretary, and it is owing to his untiring efforts that the club is in such a flourishing condition.

The Central Exchange operators arranged a very successful concert in aid of the "Many Littles Scheme," for supplying sufferers from the present trade depression with food. It was given in the Y.M.C.A. Lecture Hall on Feb. 4, 1909. The programme was a very good one and the financial results most gratifying, the sum of £9 being handed to the promoters of the "Many Littles Scheme." The District Manager, Mr. R. C. Bennett, took the chair.

Birmingham.—The Birmingham staff held their annual ball in the Grosvenor Rooms, Grand Hotel, on Feb. 5. About 200 members of the staff and their friends were present and a most enjoyable evening was spent.

Wolverhampton.—On Jan. 29 a special meeting of the telephone society was held in the Town Hall Restaurant, Wolverhampton, when a number of lantern slides, kindly lent by the Cunard Steam Ship Company, Limited, of Liverpool, and also several local slides, were shown and specially explained by Mr. F. Lucas. Songs were also rendered by Messrs. Grosvenor and Gould, the former specially illustrated, and by Misses Barlow, Mitchell and Arnold. The chair was taken by Mr. E. J. Jarrett, and the number present was 70.

A very successful whist drive, promoted by the district office staff, was held in the Town Hall Restaurant, Wolverhampton, on Feb. 15, when a large gathering was present. The prizes were won by ladies, Misses D. Lamb and M. E. Smith, first and second respectively. The gentlemen's first was won by Mr. W. W. Gould, of the district office, and the second by Mr. J. R. Smith.

Ashton-under-Lyne.—A very successful Cinderella was held in the Co-operative Hall, Ashton, on Feb. 13. The hall was tastefully decorated by Mr. J. Fisher, the floral arrangements being in the capable hands of Mr. Sowerbutts. The music was supplied by Wright's Orchestral Band, and humorous songs by Mr. F. Crosdale. This dance was admitted to have been the most successful held at Ashton. Great credit is due to Miss E. Smith and Mr. J. Hart, who carried out the arrangements.

Luton.—The second annual social gathering of the telephone society was held in Luton on Feb. 6. The gathering numbered about 60, and included Mr. J. H. Wilson (District Manager) and Mrs. Wilson. Musical items were contributed by Miss Whitmore and Miss Farrant, and Messrs. L. Sherratt, Mitchell, Cain, Williams, Bailey and Boston. The usual round games were indulged in, and a very enjoyable time spent. Mr. Raines was M.C.

Windsor.—The Windsor staff held a very successful smoking concert on Jan. 16 at the South-Western Hotel, when the chair was taken by Mr. F. Homfray, Local Manager. The staff was well represented, and among the guests were several of the Maidenhead staff. The programme was a good one, and every item was thoroughly enjoyed. Perhaps ths greatest successes of the evening were two topical songs on the Company and on the committee of the Staff Transfer Association, written by F. H. Cain and A. J. Haddock respectively,

and sung by the latter. Several phonograph selections were given by Mr. G. Hobbs, and they were much appreciated.

Chester.—The Chester and North Wales staff held their second annual whist drive at Chester on Feb. 12. A very pleasant evening was spent. Mr. and Mrs. Bates attended, and the latter very kindly presented the prizes.

Greenock.—The district staff held their annual dance in the Tontine Hotel, Greenock, on Jan. 22. The company numbered almost 100, among whom were Mr. Lamb, District Manager, Mrs. and Miss Lamb, Mr. J. A. Swanson, Chief Clerk, and Mr. A. Wilson, Chief Inspector. The latter performed the duties of M.C. in a very excellent manner, and the dance was voted by everyone present most enjoyable.

Southampton.—A very successful and enjoyable whist drive was held at the Victoria Rooms, Southampton, on Feb. 2. About twenty tables were set. The first ladies' and gentlemen's prizes went to outside friends. The second gentlemen's prize fell to Mr. Naylor, and the second ladies' prize to Miss Hall. The remainder of the evening was occupied with songs and dancing.

London.—*London Wall Traffic Staff Annual Social Evening.*—This was held on Feb. 6 on the exchange premises, where a most enjoyable evening was spent by the operating staff and others present. The musical programme consisted of songs by the Misses Mannering, Goodway, Gill, Lusty, Worbey, Millen, Street, Wigzell and McPherson, and Messrs. Collins and Humphrey, mandoline, violin and banjo solos by Miss L. Smith and Messrs. Townsend and Meens, while recitations were given by Miss Robinson, Mr. W. B. Benham and Mr. Cohen. During the intervals games were played, considerable hilarity being caused by a guessing game originated by Miss Tringham. A musical game for a prize presented by Miss Ralph was both interesting and amusing, while much laughter resulted from the costumes in a book competition, a prize for the best solution of which was given by Miss Butcher, the Clerk-in-Charge. Dancing was also indulged in. Among those present were the Chief Accountant (Mr. Stirling) and the Exchange Managers of Avenue, Bank, Hop, North, Croydon, Paddington and East. The evening was thoroughly successful, and the Clerk-in-Charge and those associated with her in organising it are to be congratulated on the result of their efforts.

Bank Traffic Staff.—The second whist drive (session 1908-9) was held on Feb. 4. A most enjoyable evening was spent, and the financial result was very gratifying, the sum of £3 3s. being handed over to the hon. secretary of the Fresh Air Fund, who was present. The prizes, which were much admired, were presented by Mr. Stirling, the Metropolitan Chief Accountant. The next "Bank" whist drive will be held at Ye Mecca Cafe, 56, Ludgate Hill, on April 22, and will be in aid of the Lifeboat Saturday Fund.

Avenue Exchange.—On Jan. 30 the Avenue operating staff entertained 300 poor children of the district at St. James School, Ratcliffe Highway, E., for the second year in succession. They were only able to cater for such a large number by the liberal response to their appeals for subscriptions. After reaching the repletion stage, when even buns and cakes no longer seemed desirable—their pockets being already well filled—the children were entertained with a performance of living marionettes, and were finally sent home happy with a parting gift of sweets, oranges and a new penny. Before this there was an interesting ceremony when Miss Forge, the Clerk-in-Charge and chief organiser of these "treats" was presented by the children with a bouquet of flowers.

Croydon Exchange.—On Feb. 13 a concert organised by Misses Dixon, Longford and Hunt, was given at the Parish Hall, South Norwood, and the proceeds (£3 10s.) devoted to the funds of the Croydon General Hospital. The evening was a great success, both financially and artistically, and not only were the Croydon district staff well represented, but the attendance of the public largely testified to the energy of those who had been responsible for the sale of tickets amongst their friends.

NATIONAL TELEPHONE PROGRESS.

EXCHANGES were opened during the month at Broxbourne (Herts), in the Luton district, and at Chew Magna (Somerset) in the Bristol district, making a total now open of 1,546. The net increase of new stations was 2,013, and the total at the end of January 477,912.

NOTTINGHAM. The local battery instruments have been changed for those of the common battery type; 1,947 new instruments were fitted in all, of which 1,700 were pedestal sets and only 247 wall sets. Several subscribers possessing switches and intercommunication sets were persuaded to change to an up-to-date private branch exchange.

NORWICH.—*Call Office Facilities.*—Permission has been obtained to place three further kiosks in public thoroughfares in Norwich, these being accessible to the public at all times are proving a great boon in all cases of emergency, especially in cases of fire and accident.

CAMBRIDGE.—Some details of the change of system from earth circuit overhead to metallic circuit underground, and from an indicator exchange to a modern common battery may prove interesting. Owing to the scattered nature of the town, of which practically half is occupied by colleges and college property, and the open spaces for which Cambridge is noted, there are 73 distributing poles with 1,500 lines entering the exchange. Most of the overhead cables were working earth circuit, and as the insulation was somewhat low, it was decided to cut away at the terminating end at the time of the change over. For this purpose two men were stationed at each pole with full instructions where to cut away, the points being marked previously, and just prior to the change the engineer and local manager cycled round to see that every man was ready. Immediately after the cables were cut, the men reported from the nearest telephone and were connected through to special instruments attached temporarily to the main frame, and were given details of any faults in their section. By this means the town was divided into easily accessible sections, and the minimum of time lost in giving attention to faults.

In the exchange, after allowing a few minutes for the complete severance of the old exchange, by plugging out the lines on the test board, the operators cleared the cut-off relays, in which a glass had been inserted, by plugging in the local sections.

One peculiar feature of the arrangements in connection with the outside work was the necessity of teeing many of the old lines to the new work, to keep the old system working, the ringing and battery (common battery) being on the B leg, whilst earth circuit lines were working on A's. As the lines were made metallic circuit to the distributing pole, one leg was earthed on the pole and the whole line kept working. When joined up through the underground to the frame the earth was removed from the pole, and the heat coil and carbons were taken out to give an earth on the one leg, whilst the heat coil only was removed from the other side, disconnecting that side from the battery. When the lines were jumpered it was necessary to reverse the jumpers on the main frame horizontal side until after the change, to avoid short-circuiting the old lines. The change was most satisfactory, the Head Office representatives being away within four hours from the time of cutting, and the staff were able to get away at quite reasonable hours in the evening.

THE APPRECIATIVE SUBSCRIBER.

THE following is an extract from a letter recently received from an appreciative subscriber in London:—

"I shall be much obliged if you will kindly convey to the proper quarter my cordial appreciation of the great kindness and courtesy I experienced at the hands of your engineer. It was most important that I should have this line by the date mentioned. Mr. —— had a fortnight only, which included the Christmas holidays, and carried it through, sparing himself, I am sure, no trouble."

THE NATIONAL TELEPHONE METROPOLITAN STAFF HOSPITAL COLLECTIONS,

(Associated with the Hospital Saturday Fund.)

A VERY successful general meeting in connection with the above was held at 58-9, London Wall, on Feb. 5, Mr. Harvey Lowe kindly taking the chair in the unavoidable absence of the Metropolitan Superintendent.

After the reading of the hon. secretary's report, giving details of the collections and benefits for the year, a most interesting address was given by Mr. Arthur W. Davis, secretary to the Hospital Saturday Fund, dealing with the work of the institution. He stated their appreciation of the work done by the staff during the year, which had resulted in their becoming the second largest subscribers to the fund.

Mr. J. Leslie and Miss F. G. Minter were re-elected to the offices of hon. treasurer and hon. secretary respectively, and after the election of the committee for the ensuing year 31 delegates to the board of the Hospital Saturday Fund were elected to represent the Company's various Head Office and Metropolitan departments.

The different departments have contributed as follows:—

	£	s.	d.
Head Office	77	9	13
Metropolitan Office	73	6	4
Traffic Department	321	6	7
Contract ,,	10	0	6
Engineer's ,,	110	4	4
Electrical ,,	69	14	6
Construction and Fitting Department	33	1	2
Stores Department	21	9	8
Electrophone, Limited	1	9	3
Workshops	9	14	0
Sales Office	1	5	11

The benefits were distributed among the following departments:—

Head Office	69
Metropolitan Office	64
Traffic Department	187
Electrician's Department	93
Engineer's ,,	104
Contract ,,	9
Construction ,,	31
Stores ,,	33
Service ,,	2
Electrophone ,,	6
Workshops ,,	10
Special necessitous cases outside the staff	4